the appraisal of

APPLICANTS to MEDICAL SCHOOLS

Edited by
HELEN HOFER GEE
and
JOHN T. COWLES

Report of the
Fourth Teaching Institute
Association of American Medical Colleges
Colorado Springs, Colorado, November 7-10, 1956

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The Appraisal of Applicants to Medical Schools

Edited by HELEN HOFER GEE and JOHN T. COWLES

With the assistance of the Planning Committee
Editorial coordination by E. Shepley Nourse

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ASSOCIATION OF AMERICAN MEDICAL COLLEGES

Organizational Roster

for the 1956 Teaching Institute

EVALUATION OF THE STUDENT

THE APPRAISAL OF APPLICANTS TO MEDICAL SCHOOLS

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Preface

To succeed at horse racing, one must have horses that not only *can*, but *will*, run fast.

The 1956 Association of American Medical Colleges Institute on Evaluation of the Student focused on the appraisal of applicants to medical schools. The achievement of this Institute was the mobilization of evidence that makes it possible for us to anticipate the selection of medical students who not only *can*, but *will*, seek high goals and reach them. As difficult as it is to identify students of superior intellect, it is far more difficult to identify students who have in addition to this ability the capacity to work persistently. At the Institute the psychologists marshaled experimental evidence providing exciting glimpses into the vast, but as yet still largely unexplored, domain of "interest" and "motivation." They showed how one can study objectively the nonintellectual characteristics of man that so dominate the uses that are made of intellectual endowment. Thus, the 1956 Institute reached a milestone in the recognition that psychology has produced insights into the mosaic of personality that have profound implications for the future of medicine.

Beyond this achievement at the 1956 Institute is the promise that continuing mutual efforts of psychologists, medical teachers, and scientists will eliminate any barriers between psychology and medicine and replace them with a dynamic interface. This replacement was indeed achieved at Colorado Springs. It puts in prospect a major advance in medical education in our time.

The tempo at the Broadmoor Institute was rapid and sustained under the skillful leadership of the chairman, Dr. John T. Cowles, and the other members of the Planning Committee, four of whom served also as chairmen of the Subcommittees that designed the programs for the four major topics of discussion and conducted the general sessions at the Institute. These areas concerned: measuring the intellectual capacity of applicants, evaluating nonintellectual characteristics by informal methods, using formal psychological techniques to appraise nonintellectual traits, and analyzing the admission procedure as a whole. At two additional general sessions, conducted as panel discussions in the evening, the origins and characteristics of professional students and the relationships between undergraduate colleges and medical schools were explored.

A total of 132 invited participants—including a score of psychologists—attended the Institute. They came from 98 medical schools: 84 in the United States, 11 in Canada, and 3 overseas. Other participants were drawn from universities, foundations, and governmental agencies. Among these participants the major medical sciences and clinical specialties were well represented, as were the social sciences.

Following the practice that has worked so well at previous Institutes, the participants themselves were divided into small discussion groups. With unremitting effort they labored from November 7 through 10, combing through the extensive data that had been assembled and analyzed prior to the Institute. In candid and vigorous exchanges of ideas they drew inferences, argued

hypotheses, proposed theories, and highlighted points for further development. Finally, each participant began to distill for himself the meaning of new ideas for his own sphere of activity. No standardized blueprint was drawn for appraising applicants to medical schools. To do so would have been folly! Rather, the participants took home with them to their own schools a wealth of concepts that had been forged jointly, and an appreciation of the need for intensive continued study of the problems of appraisal.

A promising new step was taken by the Committee on Educational Research and Services, which arranged to sponsor an annual meeting of admission personnel to be drawn from each of the nation's medical schools. The members of this Continuing Group, to function under the chairmanship of Dr. John L. Caughey, Jr., will meet at Atlantic City next October during the week end between the 1957 Institute and the 68th Annual Meeting. They plan to grapple with the practical problems of selecting students for medical schools.

At the 1956 Institute's general sessions, where the psychological data were introduced, and in the nine discussion groups, where the day-to-day accomplishments of the Institute were hammered out, polarization became strikingly apparent. This polarization was welcome. Diversity of opinion should, and hopefully always will, exist in a group of accomplished teachers—no one has a monopoly on sound principles. The impact that the psychological material was having on traditional but unverifiable educational tenets was attested to by this polarization. Great as was the unsettling effect of the psychological findings on long-accepted doctrines, it was the psychologists themselves who emphasized again and again the limits of available knowledge and the ever-present danger of substituting one type of dogma for another. The medical teachers and deans, in being tossed overboard, were warned by their psychological confreres not to *go* overboard.

Seek, and ye shall find—provided you know what to seek, and where, and how. Today medicine is increasingly in competition with other professional fields for the best students. It no longer stands first in attracting the most intelligent members of each college class. Data set forth in the present *Report* etch the picture clearly. There are many obvious reasons for this recent change. Of immediate pertinence to the participants at Colorado Springs was the emphasis placed on understanding the significance of the early influence of parents, teachers, and social groups on the development of interests in students. The occupational choices of students are often predetermined by the subculture from which they come, and all too frequently the subculture does not permit them to follow their "true" patterns of interest and ability. Many students may be forced into inappropriate channels. If medical candidates are to be more effectively guided, therefore, teachers must learn to look with more discerning eyes upon those elusive facets of candidates' personalities that reflect the many forces that impede their potentials for growth. Our ideals demand that each individual be helped to attain his full stature.

What constitutes "the most desirable medical student"? Would it be helpful to be able to construct a table showing the distribution of such students

in terms of a measure of suitability for medicine? One cannot construct such a table, of course, partly because adequate criteria have not been defined and valid means for securing the lacking data have not been formulated. But even though it may some day be possible to define appropriate criteria and to collect data, an important consideration will remain: medicine is not a unitary profession. Differing constellations of traits will necessarily be found among the physicians and medical scientists who will constitute tomorrow the broad spectrum that will be required to serve society. Aside from the probability of differences in the skills and interests of those happily engaged in such diverse activities as, say, surgery on the one hand and psychiatry on the other, there is an additional need for diversity in characteristics among surgeons and among psychiatrists. There should always be many roads to Rome. Society must learn to foster individuality, to accept egocentricity, to resist pressures leading to conformity. A selection procedure that rejected all candidates who depart from an established norm or who are struggling with personal problems and anxieties would exclude from medicine many individuals capable of making important contributions. It is the great diversity of intellect and interest that is the heritage of America and the wellspring of medicine.

All aspects of the evaluation of medical applicants, from abstruse psychological considerations to the day-to-day procedures followed by admission committees, were scrutinized at the 1956 Institute. New insight was gained by the polyvalent approach made possible by the introduction of anthropological, sociological, and psychoanalytical concepts by teachers who have devoted themselves to the problems of education. Special attention was directed at the complex appraisal of nonintellectual characteristics. As tools for use in the selection process, the interview and formal psychological tests received extensive consideration.

To many participants the most disconcerting data were those that stripped the interview of its status as a valuable aid in selecting applicants. Repeatedly it was stressed that virtually no published evidence exists that the interview has predictive validity. To say this is not to deny its usefulness for a wide variety of other purposes, among which may be listed: to verify and to clarify information, to explain in person to the applicant complicated aspects of his application, to detect gross deficiencies in emotional stability, to permit the candidate to see the medical school, and to promote good public relations. Few participants argued that the interview should be abandoned by the admission officers of medical schools. Rather, the debate concerned how to restrict its use to the proper framework. Here are significant areas for continuing research. The lively discussions concerning the interview provided some of the most illuminating paragraphs in the present *Report*.

The strengths and deficiencies of psychological tests, as well as the complexity of experimentation in this young science, were carefully and skillfully explained by the psychologists. They deplored the point of view that insists on the perpetuation of ideologies and methodologies rather than the improvement of both. In their efforts to be constructive, they pulled no punches. In a summary presentation it was pointed out that 50 years of

psychological research had largely escaped the attention of medical faculties. This will not be the case again.

New findings on personality profiles which are characteristic of physicians pursuing different lines of professional activity opened challenging horizons. What varieties of students are entering the broad field of medicine today? What sorts of persons do surgeons, psychiatrists, obstetricians, or internists resemble—engineers, farmers, bankers, businessmen? What are the characteristics of those who become ministers, teachers, nurses, social workers, i.e., professional persons interested in doing something for the good of mankind? Disconcerting indeed was the revelation based on psychological tests that many medical students have remarkably little interest in the welfare of human beings. The significance of these newer findings must be established, but their implication for the members of admission committees demands intensive and continuing study.

The 1956 Institute on Evaluation of the Student: The Appraisal of Applicants to Medical Schools, which immediately preceded the 67th Annual Meeting of the Association of American Medical Colleges, was the fourth in the series of Institutes that I proposed in 1952 in my Presidential Address, "Medical Education in Transition." The three earlier Institutes were concerned with the problems of teaching the medical sciences. Because extensive *Reports* have been published each year as supplements to the *Journal of Medical Education,* and because the growing significance of the Institutes for medical education throughout the nation has been regularly discussed by the Director of Research, Dr. Helen Hofer Gee, and by me in the Annual Reports of the Committee on Educational Research and Services, it is unnecessary to give details here.

The 1956 Institute was the first of two designed to focus on the student and all that concerns him—from procedures to appraise him as an applicant for entrance to medical study to explorations of the many forces that foster or hinder his professional growth. Having examined the problems of selection, our next Institute will deal with The Ecology of the Medical Student. It will be held at Atlantic City, New Jersey, on October 15-19, under the chairmanship of Dr. Robert J. Glaser. The organization of this Institute, which he has formulated with the help of the Planning Committee and the five Subcommittees, promises a rewarding adventure for the participants who have been invited.

The year following, the 1958 Institute, to be held at Swampscott, Massachusetts, will explore fundamental problems of clinical teaching. This Institute will be led by Dr. Julius B. Richmond, and plans are already well advanced. Thereafter, at subsequent Institutes, the Committee on Educational Research and Services proposes to make an orderly examination of all phases and areas of clinical teaching and postgraduate training in medicine.

At Colorado Springs medical deans and teachers opened the doors of their medical schools to their university colleagues in psychology more effectively, I think, than they had opened their doors at earlier Institutes to geneticists and anthropologists. Thus, once again, for the nation's medical schools vig-

orous stimuli were provided that are already leading to further experimentation in education. This vigor stemmed primarily from the dedication of the participants to the principles essential for good teaching. I tried to focus on these principles in my opening remarks at the 1956 Institute. On that occasion I quoted a passage from *The Prophet,* in which Kahlil Gibran, the Lebanese poet, philosopher, and artist, expressed very beautifully the understanding of the great teacher. I quote again from this passage because his words have profound meaning. (The italics are mine.)

> No man can reveal to you aught but that which already lies half asleep in the dawning of your knowledge.
>
> The teacher who walks in the shadow of the temple, among his followers, gives not of his wisdom but rather of his faith and his lovingness.
>
> *If he is indeed wise he does not bid you enter the house of his wisdom, but rather leads you to the threshold of your own mind.*
>
> The astronomer may speak to you of his understanding of space, but he cannot give you his understanding.
>
> . . . . . .
>
> And he who is versed in the science of numbers can tell of the regions of weight and measure, but he cannot conduct you thither.
>
> For the vision of one man lends not its wings to another man.
>
> And even as each one of you stands alone in God's knowledge, so must each one of you be alone in his knowledge of God and in his undertsanding of the earth.
>
> —Reprinted from *The Prophet* by Kahlil Gibran by permission of Alfred A. Knopf, Inc. Copyright 1923 by Kahlil Gibran. Renewal copyright 1951 by Administrators C.T.A. of Kahlil Gibran Estate and Mary G. Gibran.

Were each of us who teaches to see as deeply as did Gibran into our relations to our students, and were we to adhere steadfastly to the principles he has enunciated so compellingly, how much less prone we should be to hide behind the complaint, already ages old when Cataline voiced it to the Roman Senate, *Non est mea culpa, sed temporis.*

GEORGE PACKER BERRY, M.D.
Dean, Harvard Medical School
Chairman, Committee on Educational Research and Services, Association of American Medical Colleges

Boston, Massachusetts
August 1, 1957

Table of Contents

Part I. The Broad Perspective

Chapter 1. *Background of the 1956 Institute* 3
by John T. Cowles

Chapter 2. *Professional Students: Their Origins and Characteristics (A Symposium)* 10
A. Medicine's Share in America's Student Resources 10
by Dael Wolfle
B. Reflections on Medical Education and Some of the Problems of Selection 16
by Thomas R. McConnell
C. General Discussion 22

Part II. The Intellectual Characteristics of Applicants

Chapter 3. *Appraising Intellectual Characteristics* 31
by Robert J. Glaser

Part III. The Nonintellectual Characteristics of Applicants

Chapter 4. *Appraising Nonintellectual Characteristics* 47
by Joseph J. Ceithaml

Chapter 5. *The Interview as One Tool for Selection (A Symposium)* 60
A. A Brief Survey of the Interview 60
by Joseph Zubin
B. The Selection of Medical Students via the Psychiatric Interview 67
by Joel S. Handler
C. The Interview as a Selection Tool for Industry 72
by Francis W. Hibler
D. A Critique of the Interview 78
by E. Lowell Kelly

Chapter 6. *Appraising Nonintellectual Characteristics by Formal Psychological Techniques (A Symposium)* 85
A. A Brief Survey of the Use of Formal Psychological Tools 85
by Woodrow W. Morris
B. Possible Contributions of Psychological Testing of the Nonintellectual Characteristics of Medical School Applicants 88
by Daniel H. Funkenstein
C. The Use of Objective Personality Tests in Selection of Medical Students 112
by William Schofield
D. The Use of Projective Tests in the Assessment of Medical School Applicants and Students 120
by C. R. Strother

Part IV. Over-all Appraisal of the Admissions Process

Chapter 7. *The Typical Admissions Procedure* 131

Chapter 8. *The Student View of the Medical Admissions Process* 140
by Helen Hofer Gee

Chapter 9. *The Undergraduate College View of the Medical Admissions Process (A Symposium)* 153
A. Effects of Medical School Admissions Policy on the Liberal Arts College 153
by William E. Cadbury, Jr.
B. Some Comments on the Premedical Student Viewpoint 158
by Dorothea S. Miller
C. Needs for Liaison with Undergraduate Colleges 161
by Norman F. Witt
D. The Place of the College in Selection and Preparation of Medicine 164
by R. F. Arragon
E. General Discussion 168

Chapter 10. *The Methods and Goals of Medical Student Selection (A Symposium)* 175
A. Introduction 175
by John L. Caughey, Jr.
B. Over-all Appraisal of the Admissions Process 176
by John G. Darley
C. Multiple Criteria of Medical Education and Their Implications for Selection 185
by E. Lowell Kelly

Appendixes

Appendix A. *Supplementary Tables* 199
1. Admissions Policy and Procedures 199
2. The Interview and Other Appraisal of Nonintellectual Characteristics 204
3. The 1956 Medical Freshman 208

Appendix B. *Bibliography* 211

Appendix C. *Summary of Ongoing and Recent Research in Interest and Personality Measurement in United States Medical Schools* 218

Appendix D. *Roster of Participants—1956 Teaching Institute* 225

List of Tables

Part I. The Broad Perspective

Tables in Chapter 2

Table 2.1 Percentage of All College Graduates Who Entered Practice of Medicine, 1800-1955 12

2.2 Median Intelligence Test Scores of Graduate Students in Selected Fields 12

2.3 Undergraduate Grade Average of First-Year Medical Students 13

2.4 Two Projections of Number of College Graduates in Future Years 13

Part II. The Intellectual Characteristics of Applicants

Tables in Chapter 3

Table 3.1 Importance of Intellectual Characteristics of Applicants to Medical School 32

3.2 Importance of Various Sources of Information in Evaluating the Intellectual Characteristics of Applicants 33

3.3 Minimum Undergraduate Grade Level Required for Admission 33

3.4 Undergraduate Course Work Considered Critical in Differentiating Student Ability 34

3.5 Opinion of Importance of MCAT Scores in Evaluating the Applicants' Intellectual Characteristics 35

3.6 Opinion of Importance of Inconsistencies in Undergraduate Grades and/or MCAT Scores in Evaluating Applicants 35

3.7 MCAT Cutting Scores Established by Medical Schools 36

3.8 Types of Adjustments Made to Equate Grades Received from Various Undergraduate Colleges 36

3.9 Degree of Confidence in Evaluation of Intellectual Characteristics of Applicants to Medical School 37

Part III. The Nonintellectual Characteristics of Applicants

Tables in Chapter 4

Table 4.1 Importance of Applicant Characteristics vs. Confidence in Their Evaluation 48

4.2 Relationship Between Importance Rankings of Applicant Characteristics for Two Respondent Groups 49

4.3 Relationship Between Confidence in Evaluation Rankings of Applicant Characteristics for Two Respondent Groups 49

4.4 Information Requested on Application Forms by Medical Schools 50

4.5 Value of Premedical Advisory Reports in Appraising Various Applicant Characteristics 51

4.6 Extent to Which Various Factors Influence Evaluation of Premedical Reports 51

4.7 Preferred Type of Applicant Appraisal from Premedical Colleges 52

4.8 Psychological Tests: Present and Planned Use in Evaluating Nonintellectual Characteristics 52

4.9 Present Use of Various Sources of Information in Evaluating Nonintellectual Characteristics 53

4.10 Student Rating of the Interview 53

4.11 Student Opinion on Least Well Handled Aspects of Application Procedure 53

4.12 Students' Reasons for Rating the Interview "Poor" 54

4.13 Opinion of Institute Participants on Potential Value of the Personal Interview to the School 55

4.14 Opinion of Institute Participants on Potential Value to the Student of the Personal Interview 56

Table in Chapter 5

Table 5.1 Admission Committee Members' Opinions on the First Impression of an Applicant in an Interview 65

Tables in Chapter 6

Table 6.1 Relationship Between Grades of Selected Freshmen at an Eastern College and Parents' Education 93

6.2 Description of the S and N Syndromes 95

6.3 Withdrawal of Two Types of Students from College at End of First Year ... 96
6.4 Adjustment of S- and N-Type Students at End of First Year ... 96
6.5 College Withdrawal and Adjustment in Relation to Student Type at End of First Year ... 97
6.6 Poorly Adjusted S- and N-Type Students in Psychotherapy During Their Freshman Year ... 97
6.7 Use of Group Rorschach with Detailed Individual Analysis ... 124
6.8 Use of Group Rorschach with Multiple-Choice Responses ... 124
6.9 Use of Draw-a-Person Test ... 126

Part IV. Over-all Appraisal of the Admissions Process

TABLES IN CHAPTER 7

Table 7.1 Training and Present Position of Admission Committee Members ... 131
7.2 Extent of Public Relations Activities in Four Types of Medical Schools ... 132
7.3 Opinion on Standardization or Central Clearance of Some Aspects of the Admissions Process ... 134
7.4 Methods for Deciding Which Applicants Are Interviewed ... 134
7.5 Interview Methods Used ... 136
7.6 Interview Arrangements ... 136
7.7 Background and Training of Interviewers ... 137
7.8 Length of Applicant Interview ... 137
7.9 Starting and Closing Dates for Application Blanks ... 138
7.10 Earliest Acceptance Dates in Relation to Number of Applications Processed ... 138

TABLES IN CHAPTER 8

Table 8.1 Number of Siblings ... 142
8.2 Position Among Siblings ... 142
8.3 Education of Parents ... 142
8.4 Fathers' Occupations ... 143
8.5 Size of Home Towns ... 143
8.6 Undergraduate Majors ... 143

8.7 Location of Premedical College 143
8.8 Undergraduate Extracurricular Activities 144
8.9 Number of Medical Schools Applied to by 1956 Medical Freshmen 144
8.10 Preference Rank of Medical School Now Attending 144
8.11 Number of Medical School Acceptances Received 144
8.12 Student Opinion on Being Compelled to Accept Lower Than First Choice Medical School 145
8.13 Student Reports on Date of First Acceptance 145
8.14 Student Reports on Required Dates for Binding Commitments 145
8.15 Influencing Factors in Selection of a Medical School 146
8.16 Student Satisfaction with Basis for Selection of a Medical School 146
8.17 Influencing Factors in Selection of a Less Preferred Undergraduate Major 146
8.18 Unrequired Undergraduate Courses Taken to Aid Admission to Medical School 147
8.19 Student Opinion of Application Procedures of Medical School Now Attending 147
8.20 Student Opinion of Application Procedures of Other Medical Schools Applied to 147
8.21 Participation in AAMC Testing Program vs. Effect of Application Procedures on Attitude 148
8.22 Location of Premedical College vs. Effect of Application Procedures on Attitude 148
8.23 Student Rating of Interviews Experienced 149
8.24 Student Opinion of Psychiatric Interview as Regular Part of Admissions Procedure 150
8.25 Student Opinion on Use of Psychological Tests as Regular Part of Admissions Procedure 150
8.26 Student Opinion on Interference with Premedical Performance Caused by Admissions Problems 150
8.27 Student Self-Ratings of Anxiety as Compared with That of Other Applicants 150
8.28 Student Opinion on Factors Causing Anxiety 151
8.29 Factors Influencing Other Students Who Switched From Medicine 151

TABLES IN CHAPTER 9

Table 9.1 Opinions on Seriousness of Current Admissions Problems 155

9.2 Desire for Information on Nonaccepted Applicants....156
9.3 Required Committal Date for Applicants....159

TABLES IN CHAPTER 10

Table 10.1 Distribution of Work According to Administrative Position....183
10.2 Teaching Department and Administrative Position of Admission Committee Members....183
10.3 Teaching Rank and Department of Admission Committee Members....184
10.4 1956 Medical Freshmen Who Are Residents of the State in Which They Are Attending School....184
10.5 List of 100 Potential Predictor Variables Used in Study of Medical School Outcomes....191
10.6 List of 32 Criterion Variables and Correlations of Each with 5 Hypothetical Uncorrelated Factors or Dimensions of Medical College Outcome....193
10.7 Intercorrelations Among Factor Scores....193
10.8 Correlations Btween 5 Criterion Factor Scores and 45 Predictor Variables, Each of Which Predicts a Significant Amount of Variance in One or More of the Criteria....194

Appendixes

TABLES IN APPENDIX A

1. Admissions Policy and Procedures

Table A.1 Acceptance Procedures—Traffic Rules....199
A.2 Timing and Method for Rejection Notification....200
A.3 Methods of Selecting Members of Admissions Committees....200
A.4 Size of Admissions Committees in Relation to Size of 1956 Applicant Group....200
A.5 Membership Rotation of Admissions Committees....200
A.6 Admissions Committee Operation....200
A.7 Comments on Committee's Role in Developing Admissions Policy and Procedure....200
A.8 School Policy on Factors Involved in Screening Applicants Seriously Considered for Admission....201

A.9 Influencing Factors in Selecting State-Resident Applicants....201
A.10 Opinion on Standardization of Application Forms....201
A.11 Committee Estimates of Value of Premedical Advisory Reports in Appraising Applicants....202
A.12 Committee Estimates of Value of Essay and/or Autobiography in Appraising Applicants....202
A.13 Significance of Criteria for Assessment for Schools That Have and Have Not Attempted to Assess Success in Obtaining High-Quality Applicants....203
A.14 Significance of Criteria for Evaluating Success in Enrolling Desirable Applicants for Schools That Have and Have Not Attempted to Measure Enrollment Program Success....203

2. The Interview and Other Appraisal of Nonintellectual Characteristics

Table A.15 Extent of Outside Assistance in Interpretation of Personality and Interest Tests....204
A.16 Sources of Information on Mental Health of Applicants....204
A.17 Proportion of Applicants Interviewed in Relation to Size of 1956 Applicant Group....204
A.18 Average Number of Interviews Per Applicant to 1956 Medical Freshman Class....204
A.19 Methods Used for Reporting Interviews to the Admissions Committee....204
A.20 Verbatim Recording of Interviews....204
A.21 Opinion on Potential Advantage of Interview to Student in Relation to Extent of Use of Interview....205
A.22 Opinion on Potential Advantage to Interview to School in Relation to Extent of Use of Interview....205
A.23 Number of Interviewers Participating in Selection of 1956 Medical Freshmen....206
A.24 Distribution of Interviewers According to Their Present Position at the Medical School....206
A.25 Interviewer Familiarity with Applicant's File at Time of Interview....206
A.26 Admissions Committee Instructions on Interview Content....206
A.27 Student Characteristics Observed in Interview....207
A.28 Topics Commonly Covered in Interview....207
A.29 Applicant Appraisal by the Interviewer....207

A.30 Final Appraisal of Applicant Made on Basis of Committee Review of Interview Report....207

3. The 1956 Medical Freshman

Table A.31 Additional Information on Extracurricular Activities....208
A.32 Number of Schools Interviewing 1956 Medical Freshman....208
A.33 Number of Schools Giving Psychiatric Interview to 1956 Medical Freshmen....208
A.34 Student Comments on Opinion of Psychiatric Interview....208
A.35 Student Reports on Use of Psychological Tests Other Than MCAT....208
A.36 Region of Medical School vs. Anxiety Rating....209
A.37 Student Comments on Special Problems Concerning Admission Procedures....209

PART I

The Broad Perspective

PAGE

Chapter 1. *Background of the 1956 Institute* 3
by John T. Cowles

Chapter 2. *Professional Students: Their Origins and Characteristics (A Symposium)* 10

A. Medicine's Share in America's Student Resources . . 10
by Dael Wolfle

B. Reflections on Medical Education and Some of the Problems of Selection 16
by Thomas McConnell

C. General Discussion 22

PART I

The Blood Perspective

CHAPTER 1

Background of the 1956 Institute

BY JOHN T. COWLES

Assistant for Personnel Services to the Vice Chancellor, Health Professions, University of Pittsburgh; Chairman, 1956 AAMC Institute

AS IN ANY branch of education, medical teachers and administrators have always recognized that successful preparation of a student is a two-way process, dependent not only on the essential quality of the teachers but quite as importantly on certain characteristics of the individual student. The three earlier Institutes of the Association of American Medical Colleges have dealt rather specifically with improving the effectiveness of teaching the principal subject-matter areas of the current curriculum. In each Institute it was apparent that the central figure—the student himself—could not be ignored. His talents, interests, and the state of his development, together with the factors influencing these, are variables that surely determine the effectiveness of any teaching program.

The relevance of these student attributes in the whole medical school admission process was the theme of the Fourth AAMC Teaching Institute held November 7-10, 1956, in Colorado Springs, Colorado. There for a few crowded days representatives of the medical schools in the United States, Puerto Rico, and Canada met to explore mutual problems concerning the appraisal of applicants to medical schools. These people were truly participants in their active interchange of ideas—and this indeed is the real intent of the AAMC Teaching Institute series.

The purpose of this book is to present the highlights of the 1956 Institute. Within the framework of the topics on the Institute program, it is a symposium on the selection of students for one field in higher education—a symposium representing the formal and informal contributions of the medical school participants themselves, as well as the complete papers presented by the distinguished roster of experts in psychology and education who were guest speakers at Colorado Springs. This report is not an "answer book," for all points of view are represented, and the true outcomes of the Institute can be realized only as the ideas generated in discussion find expression in the programs and activities of the individual medical schools.

Preparation for the Institute

It was planned that two Institutes would be devoted to the Evaluation of the Student—in 1956, the Appraisal of Applicants to Medical Schools and, in 1957, the Ecology of the Medical Student, the appraisal of students within the medical school environment. Both of these are broad subjects, and it was clear to the Institute's Planning Committee from the beginning

that it was not a simple task to define the scope of the 1956 Institute.[1] The admissions process and its problems are inextricably woven, on the one hand, with preprofessional education and all the diverse factors influencing students toward medicine and, on the other hand, with the characteristic features of each particular medical school—its size, region, type of support (tax or private), admission requirements, application procedures, and the school's whole teaching program. Even more broadly, it was clear to the Planning Committee that the admissions problems of the medical schools could not be considered without reference to the relation of medicine to the other professions in attracting students from the pool of high-level human resources.

It was evident too that many problems of student selection depend upon the status of the techniques of evaluation—the appropriateness and keenness of the available assessment tools, the definitions of the desirable goals and outcomes of medical education, and the adequacy of the criteria for their measurement. Admissions officers have conscientiously attempted to define and appraise the desirable characteristics of entering students. But do admissions committees agree among themselves on what attributes they seek, and do they have the proper measuring devices to discover which applicants possess these desirable attributes? And furthermore, what factors assure that applicants who possess them will present themselves for admission to a particular school?

All these things were taken into consideration by the Institute Planning Committee. After reviewing at length the many facets of medical school admissions, the Committee decided to focus on four principal topics: (1) evaluating the intellectual characteristics of the applicant, (2) evaluating the nonintellectual characteristics of the applicant by means of the interview and other informal techniques, (3) evaluating the nonintellectual characteristics of the applicant by formal psychological techniques, and (4) evaluating the admissions process as a whole. A member of the Planning Committee served as chairman of each of these topic committees, and a group of three to five resource persons was chosen to serve on each of them to assist in planning the program and developing the necessary background material for use at the Institute.

Pre-Institute research

As these topic committees considered their assignments, it was evident that much information was not at hand concerning the present state of admissions policies, practices, and problems among the medical schools. Rather than devote time at the Institute for extensive oral note-comparing by the participants, it was decided to plan a survey of current medical

[1]The written proposal for a formal conference devoted to problems of medical school admissions grew out of a small conference of medical school admissions officers and others who gathered informally at the fall 1955 meeting of the Association to discuss common problems, as others had met similarly on many occasions before. The members of this *ad hoc* group were as follows: John T. Cowles, Helen Hofer Gee, Joseph K. Hill, Davis G. Johnson, William B. Kennedy, Schuyler G. Kohl, Peter V. Lee, Woodrow W. Morris, James O. Pinkston, Lyman M. Stowe, and Wayne L. Whitaker.

school admissions procedures and of opinions about their effectiveness. Data collection was accomplished by means of three mail questionnaires addressed to three respondent groups: (1) Institute participants, (2) admissions committee members, and (3) entering medical freshmen of 1956.

Nearly every phase of the admissions process, from the applicant's premedical years to his first contact with the medical school to his final acceptance, was touched upon in these three questionnaires. It is believed that this represents the most extensive survey and analysis of admissions yet conducted within any field of education. One of the most reassuring outcomes of the analyses was the fact that not only were current policies and practices brought to light but the problems requiring future solution emerged clearly. In all, the questionnaire analyses served the main function of "homework" for all Institute participants in developing the discussion content of the Institute itself. Almost all the tables that appear throughout the chapters of this book and in the appendix are taken from this pre-Institute research.

Questions for inclusion in the surveys were submitted by each of the topic committees and were revised, edited, and compiled into questionnaires by the Institute Planning Committee with the assistance of the research staff of the Association of American Medical Colleges. Administration and analysis of the questionnaires was handled by the Association's Director of Research and her staff.[2] A phenomenally rapid and accurate tabulation of the questionnaire data was accomplished. The student questionnaire, for example, could not be administered until late September 1956, but the complete mimeographed summary of results was in the hands of Institute participants at the time of the early November meeting.

A word should be said at this point concerning the three respondent groups. In the participants group there were 91 respondents, one each from the 84 United States medical schools, one from Puerto Rico, and 6 from among the Canadian schools. These people were chosen by their schools to represent them at the Institute. As with previous Institutes, each member and affiliate medical school in the Association was invited to designate a participant, chosen for his potentialities in contributing to Institute discussions and communicating back to his colleagues on the campus the essence of the conference.

Among these 91 members of the participants group, there were 46 M.D.'s, 29 Ph.D.'s, 14 holders of both degrees, and 2 with other degrees; 37 per cent were members of clinical teaching departments, 51 per cent were members of basic science departments, and 12 per cent held strictly administrative positions. Of this same group, 29 per cent were deans or presidents of their institutions, 48 per cent were assistant deans or other officers, and 23 per cent were department heads or other representatives of faculty and administration. Nearly all had served on an admissions committee, 79 per

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[2]Recognition is due to Charles Schumacher, who supervised the tabulation and analysis of the participants' and committee members' questionnaires, and to Clifton Gray who did the same for the freshman questionnaire.

cent of them for at least three years. Significantly, 99 per cent of the participants group asserted they were in a position to modify their school's admissions policy or procedure. For the most part, the responses of this group represent not the individual participant's personal opinion, but the composite opinion of the faculty and staff of his medical school. These 91 members of the participants group who responded to the first pre-Institute questionnaire formed the nucleus of attendance at Colorado Springs, where they were joined by a few special guests from other fields (described later in this chapter), members of supporting foundations, and members of the Association staff – 135 in all.

A shorter version of the questionnaire completed by the participants group was administered to all members of medical school admissions committees. The total of 534 committee member respondents comprised a sample of 82 per cent of all committee members functioning at that time in the participating medical schools. The committee members' sample included 52 per cent from clinical teaching departments and 41 per cent from basic sciences; 46 per cent were professors and/or department chairmen; 65 per cent had served from 3 to 20 years on the admissions committee, and 58 per cent reported that they conducted over 100 candidate interviews a year. Comparisons between the response of the participants group and of the admissions committee group to identical questions showed such consistently slight differences that in many cases throughout this book the response of only one group is reported.

The third respondent group filled out the special freshman questionnaire. All United States medical schools but one were able to give the questionnaire to all of their entering first-year students in September 1956. It was recognized that these students would not be a representative sample of all applicants to medical schools, but as survivors of the selection process they were the most readily available and cooperative group.

The questionnaire was administered to a total of about 7,560 freshman medical students, from which a 10 per cent random sample was drawn for detailed analysis. These 756 student respondents may be characterized briefly as follows: 29 per cent were from medical schools in the Northeast, 33 per cent from Southern schools, 29 per cent from Midwestern schools, 8 per cent from the West and Southwest, and 1 per cent from Puerto Rico. Most of the results of the student survey are discussed in Part IV of this book (see Chapter 8).

Interdisciplinary cooperation

One of the responsibilities of an Institute Planning Committee is providing an opportunity for participants to learn about contributions to the problems under discussion that can be made by specialists from disciplines other than medicine. It was inevitable that consideration of selection and admissions problems would mean calling on the fields of psychology, psychiatry, and education to bring individuals with specialized knowledge and sometimes conflicting views to the Institute. Most of the specialists who were invited to participate in symposia and panels, as well as in the

small discussion groups, have made direct contributions to the solution of medical student selection problems in the course of their own studies. The inclusion in these pages of their formal papers and their observations made in general discussion makes this book a unique compendium on the science of selection.

The impact of the specially invited speakers on the Institute participants was both disturbing and inspiring. It may well be anticipated that some future trends in selection procedures will be traceable to ideas they introduced at these meetings. The names of the speakers are listed in the table of contents; their papers speak for themselves.

A few words on some special considerations of program planning are appropriate at this point. For example, there was no special symposium on the appraisal of intellectual characteristics, and yet there were two groups of symposium speakers on the appraisal of nonintellectual characteristics. This was not because the intellectual area is considered less important, but rather because intellectual appraisal is more extensively validated and more familiar; medical school admissions personnel have more confidence in their knowledge of this area of measurement and in their ability to evaluate these student traits.

The distinction between intellectual and nonintellectual was, of course, made on grounds of expediency rather than clear logic. The *intellectual* area was presumed to encompass such functions as perception, cognition, memory, reasoning, and judgment, whereas the *nonintellectual* area was to encompass such functions as motivation, interests, attitudes, emotion, temperament, character, and integrity. One hardly need be reminded that none of these exists in isolation for independent measurement. Moreover, the verbal, numerical, and spatial content of much intellectual behavior lends itself to somewhat easier description and evaluation by means of objective, written tests, of which there are literally hundreds now in publication. The *Medical College Admission Test,* which has wide familiarity among medical school people and is required or recommended by all United States medical schools, is representative of present-day objective tests of intellectual (or academic) aptitudes and achievement.

The whole realm of nonintellectual behavior is, however, not yet well defined and, because of its complexity and elusive nature, there is a corresponding lack of well-standardized measures available for use in selective admissions. Nevertheless there is keen interest in, and demand for, sound tools and techniques for assessing the nonintellectual characteristics (e.g., motivation, emotional stability, or other personality traits) deemed so vital for a medical student's survival and success.

These considerations led to different program planning with respect to the two main areas of student appraisal. The Planning Committee felt that the specially invited psychologically and psychiatrically trained experts could make the greatest contribution to the Institute through symposia on the formal and informal means of evaluating nonintellectual traits.

Other parts of the program also benefited from the participation of experts who were not directly connected with any medical school. The

program closed with the far-reaching challenge of evaluating the whole admissions process presented by two leaders in the field of selection program development. Two national figures in the fields of human resources and higher education spoke in another special symposium on the origins and characteristics of students in all areas of professional education. And, since no consideration of selection for medical school is complete without attention to the continuity of undergraduate college education with medical education, one panel was devoted to premedical educators from four undergraduate liberal arts colleges.

Outcomes of the Institute

Doubtless few final answers were obtained, nor were they expected. The formally prepared papers and panels presented various points of view and suggested a wealth of ideas for large-scale research and for experimentation within individual medical schools. They were, of course, necessarily limited to only a few major topics of interest. Some important areas, for example the mechanics of the admissions process—the design of admissions forms, the clerical and technical processing of applications, the weighing and combining of evaluative data, records procedures, and related subtopics—had to be left out of direct discussion. Nonetheless, the round-table conferences, the dinner-table discussions, and the many informal interchanges during the Institute gave ample opportunity for every participant to exploit his pet principles or procedures, or to seek answers to his admissions problems. The wealth of pre-Institute survey information provided all participants with a current picture of the full range and detail of many aspects of the appraisal of applicants to our medical schools.

Perhaps the most immediate outcome of the Institute was definition of the scope of the medical selection process. Viewed longitudinally, this process obviously begins during or before the period known as preprofessional education—home, school, and other sociocultural influences, even as early as the elementary and secondary school level, determine selectively the composition of the group we identify as premedical students. The casual or planned guidance of teachers, friends, or relatives and personal experiences with physicians interact with the individual's own vocational aspiration, his assessment of his own capabilities, and his concepts of the requirements and content of premedical education, medical education, and professional performance. Consciously or not, all these may be factors in his being drawn into the stream of potential applicants to a particular medical school. Many a capable student may never feel these influences because of their absence in his cultural environment, or because of his limited or distorted view of the nature of medical education, or because the positively attracting factors are more potent with respect to some other profession.

Much could be hypothesized concerning the probable influence upon a candidate's choice of a particular medical school by its stated requirements for admission. It seems likely (and studies are needed on this very

point) that subtle factors determine an applicant's preference for a particular school—over and above the drawing power of that school's stated minimum requirements or its physical and educational assets. The real or imagined intellectual, social, or more personal qualities of the enrolled student groups; the work-climate or workload; and, negatively, the real or imagined causes for rejection of earlier candidates and failure of some students—all these play a significant part in a new applicant's choice of a medical school.

Viewed cross-sectionally, the admissions process depends not only on the composition of the applicant group—shaped by such factors as those mentioned above—but also on those particular characteristics in the applicant that any medical school identifies and weighs as desirable or undesirable in its chosen group of new students. This becomes a complex matter when we recognize that no school specifies to itself in any detail the full pattern of physical, psychological, educational, social, and cultural traits it seeks in its entering class. These ideal patterns, if they could be known, doubtless vary greatly among individual members of admission committees, differ from school to school, and surely fluctuate considerably over periods of time. Even within the individual admissions committee member, the bases on which choices of successive candidates are made may well vary, both in nature and in relative weight, in an unspecifiable manner.

Until we can identify what measurable characteristics are truly desirable in applicants to medical schools, and until we can specify their relative importance through known relations of those qualities to each other and to success in medical school or even to success in the professional pursuits beyond, it may be most judicious for no school to select its students by any rigid set of selection measures on which minimum standards have been arbitrarily established.

This then was the picture of the medical selection process that emerged from the 1956 Institute and clearly pointed the way to the 1957 Institute on the Ecology of the Medical Student. Among the Institute participants, it would be agreed that the real significance of the Institute will be realized only when and if the spirit and ideas that were generated in Colorado Springs are made manifest in future trends in medical student selection procedures. The real essence of this Institute was quite intangible but indelible. Those few crowded days, amidst the comfortable hospitality of the Broadmoor in the clear atmosphere of the Rockies, with a lake and mountain backdrop of magnificent beauty—and the inspiration of ideas developed during intense fellowship in that setting—time will not soon dissolve.

Placed in broad perspective, one of the most important questions that was asked before, during, and after the 1956 Institute was this: Is medicine attracting those students who are best endowed with the characteristics most favorable for serving the health needs of society and the research needs of medical science? In the chapter that follows, the symposium on human resources and higher education presents the background against which this question must be considered.

CHAPTER 2 A Symposium

Professional Students: Their Origins and Characteristics

A. Medicine's Share in America's Student Resources

BY DAEL WOLFLE
Executive Officer, American Association for the Advancement of Science

THE TOPIC OF general concern to this meeting centers around the selection of students for admission to medical college. To begin with I would like to point out that the medical selection committees never get the first choice. The first choice is made by the boy himself; sometimes he chooses medicine, sometimes something else, for medicine is in competition with other fields that are also interested in the good prospects from the growing generation of bright youngsters.

Determinants of a medical career choice

A boy starts out early in life to be interested in what he is going to be when he grows up. Usually these aspirations may initially have a somewhat unreal and fantasy character—he may, almost in the same breath, consider being a policeman, an aviation pilot, a gangster, and a doctor because none of these possibilities has much reality for him.

Among the choices expressed early, doctor—physician—looms fairly large and occurs fairly frequently. One of the models prominently in front of a youngster from birth on is the physician—the family physician, the pediatrician, or even another specialist. The child sees the physician occupying a position of responsibility and authority, the kind of position that some sociologists tell us has the earmarks of a prestige position in our kind of society.

The doctor is a person whose success is based on his own activity; his prestige and his work depend on what he does, not on his family position or parental background. His is a position in which he controls his own destiny instead of being subservient to the wishes or directions of someone else. It is a position in which he is serving broadly the whole of humanity. With such desirable models held up in front of the youngster, it is not surprising that more young boys want to become doctors than want, say, to become linguists or statisticians or members of other fields that are relatively strange and unknown to the youngster.

As the boy grows older, the process of choosing a career takes on more reality and involves a variety of decisions. Sometimes those decisions are made in light of an already selected goal; the child of a physician who wants

himself to become a physician may choose his school, his courses, his college, his outside activities, and his reading with that goal in mind. Sometimes, however, the choices are not made with a fixed or a known goal ahead, but they nevertheless help to delimit the occupational possibilities that lie ahead. Some of these decisions involve the curriculum a young person takes in high school—whether he chooses one that will lead on to college or not, whether he takes mathematics and the science courses. For the student who does go to college the courses that he takes and whether he emphasizes scholastic studies or outside activities may be decided with relatively little thought as to their long-term implications, but each time one of those decisions is made it is likely to close some doors and to leave other doors open.

The reasons for the choices that are made are, of course, variable. There is the well-known and frequently discussed problem of going to college in terms of the amount of money available. There are the probably even more important determinants of the motivation that the youngster has developed—the inspiration and encouragement given by his parents and his teachers and his friends, the social-cultural traditions and values of the little group in which he grows up, the aspirations of the friends with whom he associates during his growing years, and the personality traits that develop. For the young person all of these things contribute to decisions, either the minor and incidental decisions or the major one of deciding that he wants to enter medicine or wants to enter law or business or teaching or chemistry or something else.

As an outgrowth of this complex of determinants, some of the right kind of students get into medicine, some do not. Some of the wrong kind at least try to get into medicine, and from what I have heard some of you say at the Institute and on other occasions, a few of the wrong kind even succeed in getting into medical school. More happily, probably a larger fraction of those who would not be well-qualified members of the medical profession do not.

Our problem is one of increasing the number of appropriately qualified young men and women who do decide that they want careers in medicine and who are admitted to medical training. The number of good choices can probably be increased by counseling, by selection techniques, by tests, by some of the techniques and processes that are the subject of discussion at the Institute.

Underlying all of these discussions there is a general feeling that the situation isn't wholly satisfactory, that there are not enough of the well qualified or of the ones that we want to have in medical school. In opening this meeting, Dr. Thomas H. Hunter said a little wistfully, "Wouldn't it be nice if all of the members of the class were of the caliber of the upper 25 per cent." From the standpoint of teaching classes, of course it would be. Dr. Hunter went on somewhat more realistically to express the values of diversity in the members of the medical school classes, and diversity is what I am afraid one must expect, because medicine is not alone in complaining about the quality of its student body and in wanting to

have a better selection of students. One hears the same complaint and the same wish from the teachers of science, from the directors of engineering schools, from those responsible for training of nurses, from those in charge of institutions for the training of teachers, and from the leaders in practically every profession.

Medicine in competition with other fields

Medicine is in competition with other fields, particularly the sciences and the other professions, for a substantial fraction of the upper levels of ability of each growing generation and each college class. It may be worth while to look for a few minutes at what medicine now gets out of that annual competition, and for that purpose four short tables are reproduced here.

TABLE 2.1

PERCENTAGE OF ALL COLLEGE GRADUATES WHO ENTERED PRACTICE OF MEDICINE, 1801-1955*

Period	%
1801 - 1820	28
1821 - 1840	35
1841 - 1860	28
1861 - 1880	28
1881 - 1900	21
1901 - 1905	19
1906 - 1910	14
1911 - 1915	10
1916 - 1920	7
1921 - 1925	5
1926 - 1930	4
1931 - 1935	4
1936 - 1940	3
1941 - 1945	3
1946 - 1950	2
1951 - 1955	2

*Data for 1801-1900 from B. B. Burritt, *U. S. Bureau of Education Bulletin 19*, 1912, and for 1901-55 from Commission on Human Resources and Advanced Training.

TABLE 2.2

MEDIAN INTELLIGENCE TEST SCORES OF GRADUATE STUDENTS IN SELECTED FIELDS*

Field	Median score
Graduate students (all fields combined)	124
Physics and mathematics	131
Chemistry	129
English	129
MEDICINE	127
Foreign languages	126
Engineering	126
Biological sciences	126
Social sciences	124
Business and commerce	121
Physical education	115

*In adult U. S. population median is 100 and standard deviation is 20. Data from Commission on Human Resources and Advanced Training.

Table 2.1 shows the percentage of all college graduates who entered the practice of medicine. I have taken a rather long-time scale and gone back 150-odd years to a time when the principal reason for going to college was to prepare oneself for the practice of one of the traditional professions —the ministry, or law, or medicine, or perhaps teaching the future practitioners of one of those professions. A hundred and fifty years ago a very large fraction of the people who completed college entered the practice of medicine.

As time went on the percentages dropped: 150 years ago a quarter or so and now only a fiftieth or so of the college graduates enter medicine. The decline in percentage is primarily an outgrowth of the fact that the number of students, both men and women, entering college and going through college has increased greatly. So too has the variety of reasons for going to college increased—to prepare oneself for life as a football coach, to prepare oneself for life as a schoolteacher, or a mortician, or a businessman, or a great variety of other things. These factors characterize

an educational picture that is vastly different from what it was when this table started in 1801. I think we can probably expect the percentage to decrease in the future. The percentage should not, of course, be confused with the absolute number.

Table 2.2 shows the standing of students in medical colleges on tests of intelligence of the general college aptitude variety. These data come from the collection we made several years ago from a number of schools. They show medicine to be in the upper half of the distribution of students in graduate and professional schools. They are not quite at the top. There are fields that draw a group of students that average slightly higher, and there are other fields that draw groups of students that average lower. In any such list there has to be some scapegoat, and I have stopped this table with the graduate students in physical education, who average a little below any other field on the list.

I would like to point out that these are averages, and that within every group there is a relatively wide range, so that there are absolutely top-level students in each of the fields of graduate and professional work, including those not listed in Table 2.2. There are average students in every one of the groups, and there are relatively mediocre students. There is a cut-off point, of course, as determined by the selection standards of the schools and as determined even earlier by the selection standards of the undergraduate colleges. Some of those selection standards are very liberal; if you go down to the very bottom of the distribution in almost any field, you find a few cases that nobody is proud to have listed as members of the field in which he is particularly interested.

TABLE 2.3

UNDERGRADUATE GRADE AVERAGES OF FIRST-YEAR MEDICAL STUDENTS*

Year	% with grade average of		
	A	B	C
1950 - 51	40	43	17
1951 - 52	30	55	15
1952 - 53	18	68	14
1953 - 54	21	69	10
1954 - 55	17	69	14
1955 - 56	16	71	14

*Data from *J.A.M.A.* 161, 1956, p. 1659.

TABLE 2.4

TWO PROJECTIONS OF NUMBER OF COLLEGE GRADUATES IN FUTURE YEARS*

Year of graduation	Number of college graduates	
	Projection 1	Projection 2
1957	321,000	314,000
1958	324,000	325,000
1959	325,000	333,000
1960	340,000	355,000
1961	346,000	370,000
1962	346,000	377,000
1963	360,000	403,000
1964	387,000	440,000
1965	442,000	513,000
1966	418,000	494,000
1967	415,000	501,000
1968	420,000	517,000
1969	580,000	726,000
1970	540,000	687,000

*Data from U. S. Office of Education and the Fund for the Advancement of Education.

I am a little at a loss to know how to interpret Table 2.3. I include it because it seems to me that it tells something worth considering. Someone who knows the medical student selection problem better than I do should be concerned with the rapid change in the last half-dozen years in the grade distribution of students entering medicine.

There should be, in an ideal world, a table showing the distribution of medical students in terms of a measure of suitability for the practice

of medicine. I don't know how to make up such a table because I don't know any really sound data on the problem. There are impressions, and a variety of impressions have been expressed at this Institute, at least in the discussion group of which I was a member, as to what constitutes the most desirable medical student. The basic problem is one of lack of satisfactory measures. It is not merely a question of what is suitable in terms of a specific trait or pattern of traits, but rather of what is suitable in terms of the variety that is desirable for medical practice. We lack the criteria for determining when those traits are present. These are topics that Dr. Thomas R. McConnell will take up in greater detail.

Table 2.4 gives two projections (No. 1 and No. 2) of the estimated number of students who will graduate from American colleges in the next 14 years. I don't know how accurate either of these sets of figures is. I give two different projections because if only one is given people are sometimes inclined to assume that it has a greater degree of accuracy than the methods by which the figures were obtained justify. By looking at the two columns you can see that there are discrepancies between the two projections. However, every projection made on any reasonable basis indicates that the number of students who will graduate from college in 1960, 1965, 1970, or 1975 is far greater than it was in 1955. We are now in a period when the graduates from colleges are coming from the relatively small birth cohorts of the 1930's, and we will in 1965 and 1970 have college graduates coming from the birth cohorts of the much higher birth-rate years of World War II and of the postwar period.

We can, therefore, anticipate a very much larger number of college graduates. Experience tells us that the percentage distribution of college graduates, in terms of how many wish to become engineers or scientists or lawyers or doctors or something else, changes fairly slowly. We can therefore expect that if there is X percentage of college graduates in 1955 and 1956 who want to enter medicine, the percentage of the considerably larger college-graduate population of 1960 and 1965 who will want to enter medicine will not vary by a large amount from the current percentage. However, I think I can say with considerable confidence that you can look forward to a larger number of people who will enter college hoping to prepare themselves for admission to medical school.

Selecting the highly qualified student

The larger number of would-be applicants will obviously change the selection problem somewhat from what it has been in the last two or three years; the change will create opportunities for trying to select a group that is more highly qualified. In efforts to do that, we must face the problem of deciding more highly qualified for what? More highly qualified in terms of what measures? Why do we want a more highly qualified group? There is room in medicine as in other fields for people with a variety of talents and with talents at different levels.

The New Yorker, with its gift for picking up good conversational bits, quoted the other day an overheard conversation in which one woman said to another, "But, after all, Lois, he is only an average genius." There is room for quite a number of average geniuses in most fields, and with the larger number of students from whom we can pick, I suspect that it will be desirable to include some of the average geniuses as well as some of the top-ranking ones. The whole problem of what it is that attracts people to medicine and the whole problem of what it is that we want the graduates of medical schools to do get involved in the problem of selection.

One of the questions that was asked in suggesting topics that might be discussed on this program was the question of possible desirability of selection for medical training at an earlier age. There may be merit in such a proposal, unless it is carried to too early an age. The suggestion has also appealed to the members of other professions. The scientific organizations and the engineering groups have been giving a good deal of thought in recent years to the supply of people for science and engineering. One of the suggestions that is made in practically every such discussion is the desirability of recruiting people at high school age who will enter a given science or a given branch of engineering. In general I believe it to be true that as the engineering and scientific groups have thought a little more critically about this problem, they have decided that high school is not the age at which to attempt to recruit.

There is a larger problem, and one of greater social importance, with respect to the high school age level—that is to construct our educational system and to attempt to interest able students so that a larger number of them will have the plan, the drive, and the expectation of going on through college, with the result that there will be a greater interest in and a greater desire for intellectual work. For it is true that although we can look forward to an increased number of college graduates, it will probably also remain true that there will continue to be a large number of bright, able, high school youngsters who do not go to college—sometimes because of lack of money, sometimes because of lack of interest.

So in thinking about the recruitment of students for a particular field, most of the scientific groups have come to the conclusion that in the long run it will be desirable to concentrate on the broader, the more general goal of interesting a larger number of able high school youngsters in going on to college, where they can become acquainted with a variety of fields and where each can choose the one that best fits his interests.

I suggest therefore that, as we think about the problems of recruitment in the years when we have a larger number from whom to choose, we have both a research problem and a social problem to consider. The research problem is of the kind we are discussing at this Institute: to discover what are the desirable methods of selection, what are the qualities for which we want to select, and what are the qualities we consider desirable. We also have the larger social problem of fitting recruitment for medicine as a career into the general framework of inspiring talented youngsters to make the best use of their talents so that, whether they choose to enter

medicine or science or law or teaching or something else, they can contribute most to society in terms of their abilities, their talents, and their interests.

B. Reflections on Medical Education and Some of the Problems of Selection

BY THOMAS R. MCCONNELL
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University of California, Berkeley

IT IS TRITE TO SAY that the purpose of selection is prediction. In the case of medicine—and it is astonishing how comparable many of the educational problems are in a variety of professions—we have the problem of predicting at least two things: first, success in the medical school, and second, professional performance.

Nonunitary aspects of education for medicine

One notes immediately, of course, that these two aspects of achievement are not sharply divided. Some aspects of medical education partake of medical practice, most certainly if the internship and the residency are included in medical education, as I assume they must be. Furthermore, neither medical school achievement nor professional performance is unitary in character. Success in medical school obviously involves achievement in the basic sciences and in clinical studies. Presumably on account of such factors as ability, motivation, personal characteristics, and others, the student may do better in one than in the other. Furthermore, if there is any opportunity for students to participate in research, and I should hope that opportunity would exist for some of them, another source of variation in accomplishment is introduced. So, certainly, success in the medical school is not a unitary factor.

Students with medical training, as Dr. Wolfle has indicated, may do a variety of things with it. I suspect this is not sufficiently recognized at the time of admission. The following possibilities may be identified as a minimum: general practice, specialty practice, research, teaching, industry, and various combinations of these, such as teaching and research, or specialty practice and research, and so on. Specialties also can be broken down in a variety of ways. Certainly, then, students with medical training do many different things; medicine is not a unitary profession.

I suppose it is equally obvious that basic medical education is by no means a common process or experience on the part of all medical students. In looking at the catalog of medical schools or at the study in medical education that was done some time ago, one might think that there is a pretty common curriculum, a relatively common educational program.

Actually, there is probably not a common program because the abilities of the students to profit from the curriculum vary enormously from one institution to another and as a matter of fact may vary considerably within an institution. In the long run the curriculum is what the students learn, not that to which they may be exposed. I think it is obvious that in medical school A it is simply impossible to make the intellectual demands upon the students that can be made upon them in medical school B. As Dr. Wolfle has suggested, or at any rate implied, this is not to say that medical school A is not doing something worth while for its students. It is simply to say that actually there may be two different universes of students. Thus it is impossible for me to think of medical education, highly organized as it is, as something unitary in character.

About a year ago I attended in this hotel a conference of professors of psychiatry west of the Mississippi River. In the course of some rather casual discussion on the selection of students for specialization in psychiatry, one of the participants, a psychiatrist, remarked that there appeared to be implicit in the discussion the assumption that all psychiatrists do about the same things and that they are all just about alike in their characteristics. He insisted that both assumptions are erroneous. He concluded that if, in fact, psychiatrists do different things, different personal characteristics may be involved. If different characteristics are associated with different roles, all of which may be subsumed under psychiatry, these differences presumably should be reflected in the bases and techniques of selection.

It occurred to me as I looked over the excellent material which was prepared for this conference that there was something understandably missing in the data placed before the conference. What is missing is the answer to this question: What image does the member of a selection committee have in mind against which to measure the candidate for admission? Is it a well-defined or a hazy image? Is it an image of himself, somewhat adapted perhaps, or of somebody else? Is his image the same as that of other members of the selection committee? I think that until we know what these images are we will not really understand the process of selection.

More significantly, however, we probably lack at the present time adequate descriptions of the characteristics of people who are successful in various educational and professional roles. These we need as criteria against which to devise differential selection procedures.

For example, it would be desirable to know whether those engaged in different occupations in the broad field of medicine have different measured educational and vocational interests and different measured personality characteristics, or different forms or intensities of motivation. Some evidence of this fortunately may be secured from the research work[1] under Dr. Gee's direction in which the *Strong Vocational Interest Blank*, the *Allport-Vernon-Lindzey Study of Values*, and the *Edwards Personal*

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[1]For a brief description of AAMC participation in this project, see: Gee, Helen Hofer. "Report of the Director of Research," *J. Med. Educ.* 32, Jan. 1957, pp. 61-63.

Preference Schedule have been given to the seniors of 1956 and the freshmen of 1956 in 20 or more medical schools.

A study of diversification in higher education

Now I should like to say something about the general purposes of a grant from the Carnegie Corporation, under which the University of California at Berkeley has under way or in the planning stage (and in some instances quite in the preliminary planning stage) an extensive study under the general title of "The Diversification of American Higher Education." (Dr. Wolfle, by the way, is a member of the general advisory committee of this project.) One of the principal phases of this general project is a series of investigations of the characteristics of students in various types and levels of post-high school institutions. I am not by any means going to describe all of these studies, for the results are not in; I shall simply mention some of those under way, and you will see how a study of medical school students fits into this general context.

First of all, we have taken a stratified random sample of the 1,800 and more institutions of all kinds in this country, and we are trying to determine the "intellectual surface" of these institutions at the point of intake; in other words, we are attempting to find out what parts of the population, in terms of academic aptitude, are being served by higher education in the United States. In addition, we are doing what we call saturation studies in several states that have been conducting extensive psychometric programs at high school and college levels over a period of time. These states are Minnesota, Wisconsin, Iowa, Ohio, and Texas. In each of these states we are interested in finding the relative selectivity of various types of institutions in terms of student ability, and we want to know, too, more than is now available in the literature about the survival rates in these types of institutions, and the relationships of survival rates to various student characteristics.

We are interested not only in academic ability, but also in the interests, personality characteristics, and ultimately, I trust, in the attitudes and motivations of students who choose certain types of institutions and certain fields of study. It happens that in Minnesota, largely through the work of Dr. John G. Darley of the University of Minnesota—who by the way, has been associated with us from the beginning in the planning of our studies of student characteristics—we are able to get *Strong* scores for 12,000 high school graduates of 1952. These students can be followed to institutions and to major fields. It would be interesting to know whether or not the patterns of vocational interests, so far as these are indicated by the *Strong*, differ let us say in Carleton College, a selective private institution, from those in the practically equally selective college of liberal arts of the University of Minnesota only a few miles away.

One of the most interesting studies in which we are engaged is with a high-ability population. With the cooperation of John M. Stalnaker we

have given the *Strong* and a personality inventory (13 scales) to the winners and a similar number of runners-up in the National Merit Scholarship Competition, some 920 students in all. This is an unusually highly selected group of young men and women.

In analyzing the data we are interested in the following question, although it does not by any means indicate the full extent of our studies: Do students who go to different types of institutions and who choose different fields of study differ in personality characteristics as well as in academic aptitude? We should like to know, for example, whether those who are attending Harvard are different in test scores and background characteristics from those of equal academic ability who attend MIT, or whether the students who have entered MIT are alike or different when compared with those who attend Cal Tech. Such analyses will tell us more than we now know about the relationship of various characteristics to choice of institution and curriculum and ultimately to the careers of these people.

I am sure you can see now why we are happy to cooperate with Dr. Gee in her study. We are interested in the variation within and among medical schools in academic aptitude and achievement. We are even more interested in whether the student bodies of medical schools differ on some of the so-called noncognitive factors that Dr. Gee is measuring and that I mentioned a moment ago. We are also interested, as I said earlier, in the characteristics of students who choose certain types of medical activity. We would like to do something comparable for other professional fields, and we hope ultimately to have data on students in law and engineering, as well as in fields like business which professionally are not as old and well organized as medicine.

I have been told that a relatively small number of medical schools produce a large proportion of medical teachers and researchers. It would be desirable to know whether or not these schools get students who at entrance differ from those of other medical schools in interests, values, and other personality charcteristics. If such differences are found, are they due to self-selection on the part of the students, who may have an image of the school fairly clearly in mind, or to clear definition of purpose, program, and bases of student selection on the part of the institutions? If the potential medical teachers and researchers cannot be identified at the time of admission, are they bent in these directions by their educational experience in medicine, and if so what were the educational factors responsible? We could be busy for some years on this problem, but I have a notion that it is quite possible to identify some of the factors that are responsible for the maturing of interests and professional goals.

We want to study the same type of problem, by the way, in other types of institutions. Some of you are familiar with two studies—perhaps somewhat fallible but nonetheless interesting and provocative—in which liberal arts colleges, universities, and other types of institutions were ranked in terms of the productivity of scholars and scientists. One wonders whether the most productive institution, in addition to having students of very

high academic aptitude, also attract students with a high degree of intellectual interest and motivation? Are these students already more highly motivated intellectually when they enter than are students in other institutions, or is there something in the educational program of the productive schools tending to create intellectual interests and to turn students in the direction of scholarship in science and other fields?

Implications of curriculum experimentation

My last point has to do with the relationship between selection procedures and changes in medical and preprofessional curricula. I can only raise questions, obviously, not suggest conclusions. It is interesting to speculate on the consequences for admission of a new experiment which, according to press releases, is to be conducted at Northwestern—namely, the combination of premedical and medical education in a continuous program in the basic sciences, clinical medicine, and the humanities and social sciences. Presumably students will be admitted directly to this program on entering the university. This may greatly complicate selection techniques (1) if the students' work in the humanities or the social sciences becomes an integral part of medical education, and (2) if students change, as I think we assume they will in some number, to other professions or specializations before the completion of the new curriculum.

Much of the selection process is now done for medical schools at the preprofessional level. In the Northwestern experiment selection presumably will have to be done by the medical school or by representatives of the various disciplines that are involved in the program. I think we may assume that from the point of view of medical education there will be much greater attrition in the experimental than in the conventional professional program.

There is another way, it seems to me, to relate medical to preprofessional and liberal education. The study of human development might well serve as a unifying element in the student's entire educational career, including his preprofessional, or better, liberal education. (You will recognize, I am sure, the antecedents of this proposal, which in essence is obviously not new with me.) Such a center of interest would involve a good many disciplines in addition to the natural sciences, certainly the social sciences and many aspects of the humanities. The study of human development, furthermore, is not only basic to medical education; it is also important as background for such fields as teaching, social work, clinical psychology, nursing, and in fact all of the professions and occupations involving the welfare of human beings.

Students with a strong background in human biology, broadly conceived, might come to medicine with both a broader and a deeper orientation than they can now secure in a course in human development or human biology given in the medical school in a relatively short period of time during the first year or so. If the preprofessional phase of the medical student's education were to be built in considerable part around the theme of human growth and change, presumably faculty members from the appropriate professional schools, as well as those from the basic disciplines in the college or

the graduate school of arts and sciences, would participate in planning and conducting the program. If the medical school is to be an integral part of the university, the medical faculty should have much to contribute to the study of the behavioral sciences in the college, just as certain members of the college faculty may make an important contribution to professional education.

A program such as that sketched above would provide for greater continuity in the student's educational experience, a result which the medical faculties have been trying to promote more effectively through their effort to relate a study of the basic medical sciences to clinical problems.

Another means of encouraging continuity in the student's educational experience is to make him realize that he, himself, is undergoing change and maturing in new ways. Still another is to get the members of the medical faculty to look at the medical student as an example of human development. This is one of the purposes of an advisory system at the University of Buffalo Medical School in which a faculty member works closely with a small number of students throughout their residence in the medical school. These faculty advisers, seeing the problem of learning through students' eyes as well as their own, meet together in a seminar to study the medical curriculum and methods of instruction.

A member of the above-mentioned conference of psychiatrists held here a year ago commented on the hardening of students' attitudes, so far as psychological-mindedness is concerned, as they proceed through the medical school. This increasing rigidity is, I think, evident in other ways. This leads to the suggestion that throughout medical education and particularly at the postgraduate level there should be much more emphasis on critical, evaluative, experimental attitudes in the approach to medical problems—in other words, more emphasis on scientific attitudes. This is not to say that the art of medicine should be submerged. It is to say that under that art should lie a scientific spirit, a spirit which now seems to this casual observer to be so often lacking in the product of medical schools.

At the conference of psychiatrists at which I made this point, it was suggested by certain members of the group that the critical attitude could lead to the loss of the positive and confident practice of psychiatry in its various forms. I think that such a result is possible, especially among extreme dogmatists, but I should think that under proper educational conditions it is not by any means likely. How can real progress be made in psychiatry or any other branch of medicine without criticism, evaluation, and experiment leading to better understanding of mental illness and better methods of treatment? I like the suggestion made later in the discussion that psychiatry should be less concerned with a perpetuation of its ideologies and methodologies than with future improvement in both. This is the attitude that should infuse all of professional education.

C. General Discussion

AFTER THE SYMPOSIUM on "Professional Students: Their Origins and Characteristics," the meeting was thrown open to questions from the floor. The discussion that followed was of particular interest and much of it is reprinted verbatim below. The questions were concerned mostly with the drawing power of medicine as a career and student attitudes toward various aspects of medical education.

1. Medicine in competition with other fields

DR. HELEN HOFER GEE: Do you, Dr. Wolfle, have any information about the relative drawing power of medicine as a field, with respect to the aspirations of our present college population? Do you know whether there are trends toward any of the other sciences, such as engineering and the physical sciences, attracting students from the potential medical school population?

DR. DAEL WOLFLE: A few years ago there began to be a great worry about the shortage of engineers. The engineering groups organized the Engineering Manpower Commission which started out on a campaign to interest a larger number of students in entering engineering. The American Chemical Society has put on a well-organized effort to increase the number interested in careers in chemistry. To a considerable extent both have been successful. The number of college freshmen have been increasing in the last several years, and likewise the percentage of all freshman boys entering schools of engineering or planning to major in chemistry have increased during this time. Now, to some extent at least, this must mean a decrease in the number considering careers in medicine. Both medicine on the one hand and the pure sciences and their engineering applications on the other are fishing in essentially the same pool.

DR. JOSEPH ZUBIN: I think the most devastating table in Dr. Wolfle's presentation is Table 2.3, which indicates that the proportion of A students has declined from 40 per cent in 1950 to 16 per cent in 1955. That I believe would answer Dr. Gee's question on what has been happening. Although medical schools haven't increased the proportion of C's (that would remain relatively constant), it looks as though medicine is drawing primarily 70 per cent from the B's and only 16 per cent from the A's, but that was not the story back five years ago. I wonder whether this isn't a challenge for medical schools to try and go out and get proof from the A group. Perhaps what is happening is that others get in there and get the students away by either earlier attention to their needs or by glamour. Perhaps we have to go out and glamorize medicine a little more for the A student.

DR. THOMAS R. McCONNELL: Perhaps a significant factor here is the increasing parochialism that state legislatures are imposing on many schools by forcing them to restrict admissions to the students available from that state. As a result some schools are very much less able to recruit a good student body than they were some years ago.

2. Student attitudes toward a medical career

a. Research on students

DR. JOHN T. COWLES: I would like to ask Dr. McConnell: Does he have any information on the image the high school graduate has of medicine and whether the relative attractiveness of medicine has shown any trend among the choices of either high school students or college students?

I have only caught a glimpse of some studies and they have interested me very, very much. One that was sponsored by the National Science Foundation has just now been reported; it was conducted by the College Entrance Examination Board with the assistance of the research staff of Educational Testing Service (ETS).[1] They sampled a very large number of high school students and administered an aptitude measure. Among the top one-third of these students tested, thus the top third in intellectual aptitude as so measured, the preference for medicine as a vocation in relation to other vocations was rather startling to me. Some 26 per cent of these high performers on the intellectual tests were interested in engineering, whereas only 8 per cent were interested in the medical professions.

DR. THOMAS R. McCONNELL: As a matter of fact, we are using some of the data of that study. Dr. Darley, are we following about 6,900 of the graduates to the institutions which they chose? Also, a very large proportion of the National Merit Scholarship Foundation winners are going into the sciences and engineering fields.

DR. JOHN G. DARLEY: With the release of the data through the cooperation of ETS and the approval of the National Science Foundation, we will have the 6,900 coming from the top third of the group that was tested in January 1955, and will have a follow-up of them by the high school principals. This represents a remarkably good sample of the high school population of the country. We will know where they go—where they went in September 1955, at the beginning of the school year. They have been in school a little over a year now, and we will be able to backcheck and compare what they did with what they said they were going to do.

b. The selection ratio

DR. JOHN G. DARLEY: I think, generally speaking, part of your public image of medicine may have led to a decreasing frequency of choice of the field simply because, in the general transmission belt operating in any undergraduate school, the kids do become aware of the punishing selective ratio that you maintain and they will quite properly say, in the light of today's opportunities, "Well, this is not for me." Now this may not yet have reflected itself in the selection ratio factor, but it may. The selection ratio, I think, has changed a little bit in recent years. Whether it will go back up as it should proportional to the increase in enrollment remains to be seen. If it does not go up proportionally with the increase in enrollment,

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[1] "The National Study of High School Students and Their Plans," pp. 139-69 in Cole, C. C. Jr. *Encouraging Scientific Talent*. New York: College Entrance Examination Board, 1956.

then I would be concerned about the public image, not so much of the profession, but of the selection procedure.

DR. JOHN T. COWLES: I would like to ask this question, Dr. Darley: Is the students' concept of this ratio realistic, do they really know that this ratio is not so frightening?

DR. JOHN G. DARLEY: I have no way of answering that question for two reasons. It has been a long time, John, since I have been in contact with undergraduates and I don't know the accuracy of their knowledge about the selection ratio. But the accuracy of their knowledge is less important than their feeling about the selection ratio.

DR. DAEL WOLFLE: It might be interesting and worth while to point out that the selection ratio is really worse in engineering. The selection in medicine takes place very largely at and before the time of admission to medical college; the percentage of admitted students who go on to graduate is reasonably high. In engineering there is selection in the sense that some applicants for engineering schools are not admitted, but after admission the failure is about 50 per cent.

c. The time element

DR. M. GHANTUS: Do you think the length of time required for the medical school and the amount of time required for specialization and high technical learning in the school of medicine, in the various fields of medicine, has any influence upon the number of applicants that you have mentioned?

DR. WILLIAM E. CADBURY, JR. This matter of the length of the educational span apparently doesn't loom nearly as seriously in students' minds as we thought it would. We have had a number of students who have come in with advanced standing and to whom we have given advanced credit. In no case, I admit this is a very small sample, but in no case has a student used this credit to accelerate. The idea that shortening the educational span would result simply hasn't materialized to any appreciable extent in our college, nor so far as I know in other places, and I have a feeling that these young people are not in as much of a hurry as we would like to see them be. This is, I think, partly because the draft is pressing less hard on them than it did three or four years ago. Perhaps it is because of the sociological change that makes it all right for them to go on studying while their wives support them.

DR. THOMAS R. McCONNELL: Mr. Chairman, may I comment on this point? The University of Buffalo published two or three years ago a study of 20 years of experience with advanced standing by examination, and reported that a substantial number of people over that period had substantially reduced the amount of time for the baccalaureate, and not only at the University of Buffalo, for this credit secured by examination was transferrable to other institutions.

Then there is another project under way in addition to the one for advanced standing by examination, and that is early admission. This we began about 25 years ago in a small college in Iowa, before the days of the

Ford Foundation and scholarships for such people. We selected only those students who, in terms of whatever we could find out about their emotional and social development, were as ready to live in a college atmosphere as their intellectual ability and achievement would indicate. This reduced the number somewhat, as did the fact that the secondary school principals didn't want to lose the best students from their schools.

There is something, I think, to be said for acceleration at this point, in fact, I think a lot to be said for it. It may be that the reason why there was a good deal of acceleration at the University of Buffalo and not in other institutions was that in many cases Buffalo students have a very severe financial problem and if they can save a semester or a year it really is important to them. Other institutions may have student bodies in which the financial factor is not very important.

d. The cost factor

DR. C. H. WILLIAM RUHE: I certainly don't qualify as an expert in this field, but I have talked to many groups of high school students in our area and this matter of costs is always raised in the matter of the medical education. Perhaps students are not so much concerned with the duration of the training program, but they are very much concerned with the cost of it. Since they have to go to school about twice as long to become a doctor as they do to become an engineer, it doesn't take much mathematics for them to figure out it is going to cost them at least twice as much. They always ask about this particular point and I am quite sure it is a determining factor for some people.

3. Student interests as measured by psychological tests

DR. JOHN T. COWLES: We have Dr. E. Lowell Kelly here with us. He has done considerable work with the *Strong Vocational Interest Blank* which is now being used in the AAMC research programs (see Appendix C). Would Dr. Kelly care to comment a little on the stability of interest that may be revealed by such measures? Are we able, for example, to determine the relative strength of interest in medicine among high school students? Is high school the place and point at which we might capitalize or enhance those interests and count on their being stable and enduring up to the point of active choice of a medical school after college?

DR. E. LOWELL KELLY: I am sure that Dr. Darley knows more about this than I, but I will give an expression of opinion. Apparently these patterns of interest are developed rather early, preadolescent in some cases, but become pretty well formed by the time a youngster is through high school—which is not to say that they don't change somewhat after that for some people. It is a question of how much stability we are talking about, but in general I think that the average high school senior, bright enough to go to medical school, is likely to have a pretty clearly formed interest pattern, which is sufficiently accurate and a pretty good predictor for himself and for the medical school. Do you agree with me, Jack?

DR. JOHN G. DARLEY: The problem is the interpretation of the overall pattern of the score on an instrument like the *Strong*. You also have the problem of the relationship between the claimed choice and the measured interest patterns. One must remember quite clearly also that the measured interest patterns do not necessarily relate heavily to success in the preprofessional years. Now, when you look at Lowell's data and some other data on the nature of the prediction from the keys within the professional school, then you are dealing with a different domain of behavior, but you cannot use the *Strong* as a basis of the selection for the preprofessional years if you expect it to relate to preprofessional grades. These are different things.

DR. THOMAS R. FORBES: I think it is worth adding to this comment on interest, however, the well-known fact that the number of freshman college students intending to go into medicine is three or four or five times as large as the number who persist in that intention by the time they get to be seniors. This, I suppose, doesn't necessarily reflect a change in interest, but it reflects at least a sufficient degree of discouragement or diversion of interest to account for this result.

DR. JOSEPH ZUBIN: Isn't there some confusion here about the term "interest"? Interest in the sense of an expressed desire to go into medicine versus interest pattern as revealed by the *Strong Interest Blank*. The two are not the same. The person may not know that he has the interests of a physician yet have them as expressed on the test. I was rather astounded that so few medical schools are using the *Interest Blank*. In fact, I believe I noticed only 4 per cent of the schools (see Table 4.8 in Chapter 4) are using the *Strong Interest Blank*, and some claim they tried and didn't find it so useful. It is perhaps the single most important psychological test of attitude and interest in medicine that is available, and furthermore it has some ancillary values insofar as it is also helpful in the determination of the field of specialty later on. There are now keys that will differentiate the surgeon from the internist, from the psychiatrist, and so on. These, although not quite as accurate as the basic scale, seem to be quite useful for future selection.

One more thing, if you find a student who has no particular pattern, has no A's in any of the keys, he is more likely than not to be preschizophrenic, because preschizophrenics seem to show a complete lack of pattern in their inventory, in the Strong Interest Blank.

DR. DANIEL H. FUNKENSTEIN: Dr. McArthur at Harvard has found out that with private prep school boys the *Strong Interest Blank* does not predict career choice, whereas with the boys who go to regular public high school it predicts both job choice and job contentment very well.[2] At Harvard College the *Strong* does not "work" with prep school boys.

DR. JOHN G. DARLEY: I would like to emphasize that it is not that the *Strong* doesn't "work," it is that you don't need it when students' occupational choices are so completely predetermined by the subculture from

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[2]McArthur, Charles. "Long-Term Validity of the Strong Interest Test in Two Subcultures," *J. appl. Psychol.* 38, no. 5, 1954, pp. 346-53.

which they come. All you need to do is to ask a boy in this particular private prep school what he is going to be and you get the right answer since this is totally predetermined by his entire environment. The *Strong* may truly reflect another pattern of motivation which his subculture does not allow him to use, and this is the tragedy of that subculture.

PART II

The Intellectual Characteristics of Applicants

PAGE

Chapter 3. *Appraising Intellectual Characteristics*..... 31
by Robert J. Glaser

CHAPTER 3

Appraising Intellectual Characteristics

BY ROBERT J. GLASER
Dean, University of Colorado School of Medicine

THE INDIVIDUALS charged with the difficult and challenging responsibility of selecting applicants for admission to medical schools are, of course, concerned with the over-all evaluation of candidates rather than with the estimation of a single quality such as intellectual capacity per se. Few, therefore, would disagree with the idea that an applicant should be judged as a whole person, that is in terms of his personality, his scholastic and extracurricular achievement, and his apparent motivation for the study of medicine. Further, few would take issue with the desirability of selecting for a medical school class young men and women with a variety of personal characteristics, for excessive uniformity tends to make for a less stimulating intellectual environment. If one admits the arguments advanced above, however, he by no means suggests that the intellectual capacity of the applicant is of minor importance, for it is apparent that a distinctly above-average intellect is necessary for the successful completion of the medical curriculum. Thus, the evaluation of the intellectual qualities of the applicant to medical school is of great importance in the selection process, and properly at the 1956 Teaching Institute this subject constituted a major topic of discussion.

Pre-Institute research

In order to obtain information that would accurately reflect the points of view of those who are concerned with the selection of students for the medical schools of the country, the Planning Committee for the 1956 Institute prepared a questionnaire that was circulated both to Institute participants and to admissions committee members at the various medical schools. Eight questions dealing with the appraisal of the intellectual characteristics of applicants were prepared and submitted to the two groups as part of this survey.

As pointed out in Chapter 1, it was intended that the questionnaire responses of the participants group reflect the viewpoint of the school as a whole and that those of the committee members group express the diversity of individual opinion. Discussion at the Institute made it evident that there were variations in the techniques used by participants to arrive at the school-as-a-whole viewpoint in answering the questionnaire. Some held formal meetings and obtained majority expressions of opinion from the individuals concerned with admissions at their schools; other participants undoubtedly made subjective judgments about the consensus among their colleagues in filling out the questionnaire.

However the participants obtained the opinions representative of their schools, the responses were in many cases quite similar to the responses of individual committee members. Still in some of the tables reproduced here (e.g. Table 3.2) a tendency will be noted toward endorsement of more extreme responses by the participants group than by the committee members group. This may reflect a tendency on the part of admissions personnel in a formal group setting to express what they perceive to be the expected or desirable response—their private opinions being somewhat more conservative—or, again, it may reflect slightly biased judgments of individual participants in recording the "group" opinion. The same effect would also have resulted if large admissions committees are more conservative in their judgments than small ones. The question is not of sufficient importance, however, to warrant detailed analysis, particularly in view of the fact that habits of expression create problems in semantics when words like "some" and "much" are related to actual behaviors as they were in the questionnaire.

Questionnaire results

Admissions committee members and participants were asked to indicate the importance they attach to the intellectual characteristics of applicants. All would agree that intellectual traits are of at least some importance. As shown in Table 3.1, about 90 per cent of both groups of respondents assign great importance to this aspect of the candidate's qualifications.

TABLE 3.1

IMPORTANCE OF INTELLECTUAL CHARACTERISTICS OF APPLICANTS TO MEDICAL SCHOOL

Respondent group	N	% of each group citing importance	
		Much	Some
Participants	91	89	8
Admissions committee members	534	89	10

In an attempt to determine the measures relied on by admissions committees in evaluating the intellect of applicants, respondents were asked to indicate how often a given measure was employed and how much importance was attached to it (see Table 3.2). Whereas grades, letters of recommendation, and *Medical College Admission Test* (MCAT) scores are available in nearly all schools, scores of the *Miller Analogies Test, American Council on Education Psychological Examination for College Freshmen* (ACE), and *Selective Service College Qualification Test* (SSCQT) are often not available, and hence are not used by a significant number of admissions committees. The *Graduate Record Examination* is apparently taken by a fair number of medical school applicants, probably because of a concomitant interest in other graduate pursuits, and its scores are used to a limited extent by medical school admissions committees in the intellectual evaluation of applicants.

TABLE 3.2

IMPORTANCE OF VARIOUS SOURCES OF INFORMATION IN EVALUATING THE INTELLECTUAL CHARACTERISTICS OF APPLICANTS

Source of information	% citing importance of data from each source				
	Little or none	Some	Great	Not available	No response
Participants group (N = 91)					
Over-all grades from college transcripts	0	13	86	0	1
Science grades from college transcripts	0	23	76	0	1
Nonscience grades from college transcripts	1	58	40	0	1
Individual letters of recommendation from undergraduate faculty members	9	54	35	1	1
Letters of recommendation from other than undergraduate faculty	62	32	3	2	1
MCAT scores	2	43	50	3	2
Graduate Record Exam scores	11	19	7	61	2
Miller Analogies Test scores	6	4	1	87	2
ACE scores	8	10	3	77	2
SSCQT (Selective Service College Qualification Test) scores	23	12	1	62	2
Other	1	8	10	0	81
Committee members group (N = 534)					
Over-all grades from college transcripts	*	26	73	*	*
Science grades from college transcripts	1	29	70	*	*
Nonscience grades from college transcripts	2	69	28	*	1
Individual letters of recommendation from undergraduate faculty members	10	56	30	2	1
Letters of recommendation from other than undergraduate faculty	63	31	2	2	1
MCAT scores	4	55	37	3	1
Graduate Record Examination scores	6	23	7	59	5
Miller Analogies Test scores	2	4	*	87	6
ACE scores	6	5	2	81	6
SSCQT (Selective Service College Qualification Test) scores	12	7	*	72	8
Other	*	4	5	*	90

*Less than 1 per cent response.

It seems clear from Table 3.2 that admissions committees attach greater importance to the over-all grade average of applicants than to any other single factor, although science grades alone are relied on almost to the same degree (see also Table 3.3). Much less significance is assigned to nonscience grades. An intermediate position is given both MCAT scores and letters of recommendation from undergraduate faculty members; letters of recommendation received from other than undergraduate faculty are accorded rather limited attention.

Both the respondent groups were asked to list the college courses they consider critical in differentiating between more and less able applicants. As can be seen in the multiple-response Table 3.4, physics and chemistry are

TABLE 3.3

MINIMUM UNDERGRADUATE GRADE LEVEL REQUIRED FOR ADMISSION

(Participants group)

Minimum grade level	% of 91 schools
Passing grades in premedical courses	3
Passing grades in all courses	2
C in all courses	15
C in premedical courses	1
C+ in all courses	29
B in premedical courses	2
B in all courses	8
No response	40

ranked as first in importance by both participants and committee members. Mathematics was cited almost as often, and humanities was listed in fourth place. The social sciences and foreign languages are considered of least importance in differentiating student ability.

TABLE 3.4

UNDERGRADUATE COURSE WORK CONSIDERED CRITICAL IN DIFFERENTIATING STUDENT ABILITY

(Multiple response)

Course	% of 74 schools*	% of 403 committee members*
Chemistry (area not specified)	35	48
Organic chemistry	31	25
Physical chemistry	5	4
Other specified chemistry courses	4	4
Physics	55	51
Biological sciences (area not specified)	18	19
Anatomy	14	8
Embryology	5	3
Zoology	4	7
Genetics	1	†
Social sciences (economics, history, political science, psychology)	4	6
Sciences (science not specified)	24	24
Mathematics	49	41
Humanities (arts, literature, philosophy, religion, English)	34	35
Foreign languages	4	7
Other	2	5

*Note that 74 out of 91 participants and 403 out of 534 committee members indicated they believed some courses were critical in differentiating student ability.

†Less than 1 per cent response.

The MCAT is considered to be important by both participants and committee members, greatest emphasis being given to the score on the science subtest and somewhat less to that measuring quantitative ability. In general, knowledge of modern society as measured by MCAT is not considered to be of major importance in the evaluation of the applicant's intellect (Table 3.5).

The question of the importance of inconsistencies in grades and/or MCAT scores in the evaluation of intellectual capacity of applicants was examined, and the results are reported in Table 3.6. Erratic over-all grades or science grades are interpreted as important evidence of lack of promise for medical education. In contrast erratic MCAT scores, although viewed with some alarm, are not considered to be of as much importance as erratic grade performance. Low MCAT scores and high grades, and the reverse combination of high MCAT scores and low grades are viewed unfavorably to approximately the same extent; still, as will be noted later, at the Institute round tables the latter combination was considered as being more compatible with "good intellect" than the former.

TABLE 3.5

OPINION OF IMPORTANCE OF MCAT SCORES IN EVALUATING THE APPLICANT'S INTELLECTUAL CHARACTERISTICS

MCAT subtest score	% citing importance of score					
	Not available	None	Little	Some	Great	No response
Participants group (N =91)						
Verbal Ability	1	0	6	56	27	10
Quantitative Ability	2	1	3	51	34	9
Modern Society	1	2	16	65	6	10
Science	2	0	3	33	54	8
Average of the four scores	2	6	12	41	25	14
Committee members group (N =534)						
Verbal Ability	1		8	56	27	8
Quantitative Ability	1		8	45	37	9
Modern Society	3		16	63	9	9
Science	*		4	35	53	8
Average of the four scores	4		10	45	29	12

*Less than 1 per cent response.

High MCAT scores with low grades suggest that the applicant has good intellectual potential, but further investigation must be made to determine why the student did not perform well in college despite the apparent intellectual promise. He may be an "underachiever" because situational or personal problems may result in poor motivation; competing activities, such as work and extracurricular activities, may interfere with grade-getting; or competition for grades may be severe at the student's undergraduate college. However, studies have shown that the extracurricular leaders are generally the brighter and better achieving scholars. Employed students are also high achievers as a rule.

On the other hand, low MCAT scores accompanied by high grades indicate certain other possibilities, such as truly low potential, but apparent high scholastic achievement through an easy grading system or through

TABLE 3.6

OPINION OF IMPORTANCE OF INCONSISTENCIES IN UNDERGRADUATE GRADES AND/OR MCAT SCORES IN EVALUATING APPLICANTS

Inconsistency	% citing importance of inconsistency				
	None	Little	Some	Great	No response
Participants group (N =91)					
Erratic over-all grade score	0	3	52	38	7
Erratic grades in science courses	0	3	45	45	7
Erratic MCAT scores	2	12	63	14	9
Low MCAT scores and high grades	0	7	48	37	8
High MCAT scores and low grades	0	4	51	37	8
Committee members group (N =534)					
Erratic over-all grade record	0	6	50	40	4
Erratic grades in science courses	*	4	46	45	5
Erratic MCAT scores	1	18	63	12	6
Low MCAT scores and high grades	1	13	46	34	6
High MCAT scores and low grades	1	11	46	36	6

*Less than 1 per cent response.

intense concentration on studies by the student. Another possible but not likely explanation is poor motivation or illness or fear in taking the MCAT so that test performance is not representative of true potential.

Somewhat less than half of the participants report use of a cutting score for the MCAT; i.e., rejection of applicants with scores below an arbitrarily selected level. For the most part, when cutting scores are employed three levels predominate. One group turns down students with scores below 400 (16th percentile on national norms), a second group cuts at 450 (31st percentile), and the third major group rejects those with scores below 500 (50th percentile). These findings are reported in Table 3.7.

TABLE 3.7

MCAT CUTTING SCORES ESTABLISHED BY MEDICAL SCHOOLS
(Participants group)

MCAT cutting score	% of 38 schools using cutting scores on MCAT subtests*					
	Verbal Ability	Quantitative Ability	Modern Society	Science	Average of 2 or 3 Scores	Average of 4 Scores
375 or below	7	5	5	8	0	3
376 - 400	16	11	16	10	3	3
401 - 425	0	0	0	0	0	0
426 - 450	8	13	11	13	0	0
451 - 475	0	3	0	5	0	0
476 - 500	8	10	5	13	3	0
501 - 525	3	0	0	3	0	0
526 - 550	3	3	3	3	0	0
551 - 575	0	0	0	3	0	0
No response	55	55	60	42	94	94

*Of the 91 schools, this 42 per cent report establishment of cutting scores and 53 per cent report they do not; 5 per cent did not respond.

TABLE 3.8

TYPES OF ADJUSTMENTS MADE TO EQUATE GRADES RECEIVED FROM VARIOUS UNDERGRADUATE COLLEGES
(Participants group)

Type of adjustment	% of 91 schools
Formal adjustment*	10
Personal informal evaluation based on past experience	27
No adjustment	63

*Includes adjustments on the basis of MCAT science score and those using objective weighting methods developed from comparisons of premedical grades and medical school performance.

The very difficult problem of equating grades at various undergraduate colleges is a familiar problem to all admissions committees. The task becomes all the more difficult for those medical schools drawing applicants from many colleges in different parts of the country. Participants were asked to indicate whether they attempted to adjust grades from various colleges, and if so how such adjustments are carried out. Only 10 per cent make formal adjustments (Table 3.8). The methods employed include use of MCAT science scores as a reference scale and use of objective weighting measures developed from a comparison of premedical grades and medical

school performance of graduates of given schools. Approximately one-fourth of the schools make adjustments by informal evaluation based on past experience.

Finally, the questionnaires for participants and committee members asked for identification of the degree of confidence placed in evaluation of intellectual characteristics of applicants. As can be seen in Table 3.9,

TABLE 3.9

DEGREE OF CONFIDENCE IN EVALUATION OF INTELLECTUAL CHARACTERISTICS OF APPLICANTS TO MEDICAL SCHOOL

Respondent group	N	% of each group citing degree of confidence in evaluation of intellectual characteristics		
		Much	Some	Little
Participants	91	58	37	4
Admissions committee members	534	43	53	3

only 58 per cent of schools as reflected through participants and 43 per cent of individual admissions committee members have a large measure of confidence in their evaluation of the intellectual characteristics of applicants. Thus there is a distinct disparity between the importance assigned to intellectual characteristics (cf. Table 3.1) and estimation of ability to select applicants critically in this respect.

Chi-square analyses

The data presented above are inconclusive rather than selective; i.e., they represent the total nationwide results without reference to certain important defining factors which characterize and differentiate schools—among these are size, type of support (public or private), and locale. Private schools generally have no geographic restrictions insofar as admission policies are concerned and thus deal with frequently larger and more varied applicant groups than do state-supported institutions. In statistical analyses of a number of questionnaire results, it was possible to examine some of the correlates of response categories, and the findings were of distinct interest. (A complete report is available from the Director of Research of the Association.)

It was found, for example, that letters of recommendation are assigned greater importance by committee members from schools which process more than 1,000 applications yearly than by members of committees which process fewer than 1,000 applications. MCAT scores are rated of greater importance by those who deal either with large or small numbers of applicants than by those with a medium-sized applicant group.

Those medical schools with very large applicant groups attached more importance to intellectual characteristics of applicants than the schools with small applicant groups. It is immediately apparent that there may well be much greater need for the committee with a very large group of applicants to give special attention to intellectual appraisal, particularly at the early screening-out stages of the selection process.

The admissions committees of privately supported institutions place more importance on intellectual characteristics than do those of state-supported medical schools. For the most part, however, since the former schools tend to have larger applicant groups, the point raised in the previous paragraph is again relevant. Similarly, the fact that MCAT scores are assigned more importance by the committees in privately supported schools than in state-supported ones may again reflect the wider choice characteristic of the larger private school applicant groups.

Statistically significant differences were recorded in the area of academic achievement; more importance was attached to this factor by medical schools in the North Central and West than by those in the Northeast and South.

The fact that letters of recommendation from college faculty members are given greater weight by the admissions committees in the Northeastern medical schools than by others may reflect the fact that the colleges in this area, which supply a significant proportion of the students admitted to this group of schools, are characterized by relatively small student bodies and high academic standards. These points suggest that individual students are better known to their instructors who, therefore, can write more detailed and reliable letters about a generally able group of applicants; also, geographical proximity to the medical schools means, of course, that the premedical advisers are well known to the admissions committees. Although there are many fine undergraduate colleges throughout the country, the concentration of such institutions in the Northeast is probably a relevant point.

Discussion at the Institute

When the 1956 Teaching Institute was convened at Colorado Springs on November 8, 1956, Topic I, entitled "Appraising the Intellectual Characteristics of the Medical School Applicant," formed the basis of the first session. Following a brief introductory presentation by the chairman of the Topic I Subcommittee, the participants were divided into nine discussion groups, each made up of 12 to 14 participants. As in previous Institutes, one member of each discussion group was designated as chairman and another as recorder. Although a series of questions was prepared to serve as a possible guide to discussion, the groups were not directed to deal specifically with these questions; in other words, no attempt was made to structure the discussions along set lines. An opportunity was provided for more detailed discussion of a number of problems relating to the evaluation of intellectual characteristics of applicants. The following section of this chapter deals with some of the problems discussed in the round-table groups.

Undergraduate grades

As noted in the section on questionnaire results, over-all grades as well as science grades are considered of distinct importance as measures of

the intellectual qualities of applicants. The problems involved in interpreting grades, however, are recognized to be of real magnitude. For example, academic standards in the undergraduate colleges of this country vary markedly. In one respect, the task of equating grades of applicants may be more of a task for medical schools with geographically unlimited student bodies than for those schools whose students came from a smaller (and often more comparable) number of colleges. Since all colleges give A grades to their best students, grades provide no means of differentiating students from colleges with entirely different academic standards. It is possible that an A student at one college might be only a B or even a C student at another institution. Actually this problem may be much more serious with B or C students; often the very best students at academically poor colleges may indeed be superior, but the student bodies of such colleges number relatively few gifted students, whereas certain other undergraduate colleges attract many able students—with the result that their standards are far higher and grades of B or C may be compatible with satisfactory academic achievement and especially with a better-than-average intellect.

In reply to a specific questionnaire inquiry regarding the equating of grades, only 10 per cent of the respondents indicated that formal adjustment was attempted. During the round-table discussions, several methods used for equating grades were outlined. One method applies when a reasonably large sample from a given college has been observed and a frame of reference based on this accumulated experience can be developed. Another method is to consider MCAT scores (either averages of all the subtests or the score on a single portion of the test, e.g., that on the verbal subtest) as a standard against which grades can be equated.

One of the significant problems insofar as grades are concerned is that they constitute evidence of intellectual performance but not necessarily of intellectual capacity (or potential). Grades per se should also be interpreted in terms of the effort expended by the student. Even among students from the same college, the same grade-point average may represent an extreme effort on the part of one student and relatively little on the part of another.

A difficult, rather specialized problem facing the admissions committee is the evaluation of the applicant with fine personal qualities who has spent many hours in extracurricular pursuits and has not acquitted himself impressively in terms of his scholastic record. Although studies show a generally positive relationship between grades and extracurricular participation, there are many exceptionally active and able students whose undergraduate grades suffer. Is this individual applicant immature and guilty of poor judgment? Or is he the type of man who is often well motivated for medicine and who, funneling his energies and drives efficiently once in medical school, will do very well indeed?

The identification of the so-called "late-bloomer" is desirable but not always easy. The student who matures a bit later than his fellows may in the long run outshine them. All admissions committees are familiar with the men

who perform poorly in college initially, then drop out for military service—during which time new value systems develop and goals become clarified—and finally return to college to become effective, able students and physicians. It is obviously desirable to be able to select such persons for admission to medical school, but often the decision is rendered difficult because the situation may not be clear-cut.

The Medical College Admission Test

The Institute discussions gave some consideration to the *Medical College Admission Test* and its interpretation. One point made was that in interpreting MCAT scores, attention must be paid to the student's previous experience with objective tests. Such tests are widely used in high schools and colleges these days, but in a few smaller colleges objective tests are used infrequently or not at all, and students from such schools may have real difficulty in dealing with an objective measurement instrument. Conversely, in other colleges where classes are large, objective tests are employed widely and students in these institutions become test-wise. All other things being equal, some advantage undoubtedly accrues to the latter group of students.

Emotional factors may also play a role in the student's performance on the MCAT. A striking example is provided by the case of a very able student who did poorly when subjected to sharp time limits such as characterize the MCAT, but whose subsequent medical school career was impressive. Students who are suffering from an illness, e.g., respiratory infection, when they take the test may turn in a poorer performance than would have otherwise been the case, although studies have indicated that malaise does not necessarily interfere with test performance.

The important question of the predictive value of the MCAT was given a good deal of attention by discussion groups at the Institute. Discussants agreed that low to average grades combined with relatively poor MCAT scores suggest an unfavorable academic prognosis, whereas low to average grades coupled with an impressive MCAT performance is compatible with a creditable ensuing record in medical school.

A number of individual experiences with studies of the test were brought up and discussed. W. W. Morris, for example, reported high positive correlations between MCAT scores and subsequent medical school performance of students admitted to the State University of Iowa College of Medicine.[1] O. A. Thorup, on the other hand, said no correlation was found with grades at the University of Virginia. Many of the published studies show similar variations in results.[2] A number of factors that influence the apparent predictive efficiency of the MCAT were brought out in the discussions of these apparent contradictions.

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[1]Morris, W. W. Unpublished study, State University of Iowa, 1956.

[2]For example, see Gottheil, E., and Michael, C. M. "Predictor Variables Employed in Research on the Selection of Medical Students," *J. Med. Educ.* 32, 1957, pp. 131-47.

[The selection process itself, at most schools, utilizes effectively and to the fullest possible extent the information that the MCAT provides. It is a well known phenomenon of educational measurement that reducing the range of ability reduces the correlation between two related measures of that ability. Further, other more subtle aspects of the selection process may have an even more devastating effect on the demonstration of statistical relationships between the MCAT and medical school grades. In general, students who are high achievers at one level of education are high achievers at the next, thus the practices of admitting to medical school those students with very high MCAT scores, in spite of very mediocre records of undergraduate academic achievement, and those students with low MCAT scores who show evidence of being outstanding students in other respects, militate vigorously against the demonstration of predictive validity of the test when simple correlation studies are made. These effects are apt to be more prominent in predicting achievement in medical school than in other areas of higher education because of the high selection ratios that exist in this field. Considerable assurance of the predictive validity of the MCAT is obtained in the consideration of correlations with undergraduate grades and grade averages and with other measures of intellectual aptitude.[3] Drop-out statistics also provide positive evidence of effectiveness.[4]—ED. NOTE.]

In the Institute discussion groups it was generally agreed that each school needs to carry out its own local studies of relationships, not only of the MCAT but also of other selection measures, with the best available criteria of student performance in medical school. It is the fortunate medical school that has on its staff a professionally trained and skilled individual who can develop within the school setting improved measures of the more significant behaviors of the physician-in-training. Perhaps it is overly optimistic to suggest at this time that sound means of evaluating actual physician practice can be developed and that eventually selection measures may be validated against these more "ultimate" criteria—although it is a fact that beginning steps in this direction have already been taken.[5]

Student communication skills

The role of communication skills in academic performance was another problem area to which attention was given by discussion groups at the Institute. It was agreed that many students are unable to express themselves well in writing when they enter college, and as a result their academic records often suffer. The status of the communication skills of medical students has been investigated by Morris at the State University

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[3]Burnham, Paul S. Unpublished study briefly summarized in Crawford, Albert B. *Report of the Director of the Student Appointment Bureau for the Year 1951-52*, Bulletin of Yale University, series 48, no. 20, Oct. 1952, pp. 11-12.

[4]Dykman, R., and Stalnaker, J. M. "The History of the 1949-50 Freshman Class," *J. Med. Educ.* 30, 1955, pp. 611-21.

[5]Peterson, O. L., Andrews, L. P., Spain, R. S., and Greenberg, B. G., "An Analytical Study of North Carolina General Practice 1953-54," *J. Med. Educ.* 31, part 2, Dec. 1956.

of Iowa. All entering medical students were tested for all communication skills; a comparison with the performance of these students three or four years earlier in the College of Liberal Arts demonstrated that they were initially strong in objectively tested skills and in addition showed marked improvement by the time they were first-year medical students. However, in the specific area of writing skills, the premedical students were initially weak, and by the time they were first-year medical students had demonstrated no such improvement as that reported above. A similar finding had been earlier recorded in a study done in the College of Liberal Arts which showed little improvement in the writing and speaking skills of liberal arts students after three years of college. These results are discouraging and point to the need for further research in this important area.

College premedical advisers

Potentially, premedical advisers or committees may provide valuable information regarding the intellectual competence of applicants from their colleges. The majority of those who serve as advisers are members of science departments and usually have had an opportunity to observe the applicants as students in one or more courses. Even if direct observation has not been possible, they are able to discuss the students with their colleagues who have taught them and in this way to obtain an estimate of their intellectual performance. If the medical schools report back adequately on the performance of students admitted from the given college, frames of reference are provided which enable the advisers to make more meaningful estimates in subsequent years.[6]

In a few instances a large measure of responsibility in selection of students to be admitted from a given college is assigned the premedical adviser; indeed, he may be given the privilege (or the task) of nomination of the candidate, or candidates, from among his group of applicants who he feels should be admitted. This degree of delegation of responsibility is not considered desirable by the majority of admissions officers, but may be satisfactory in specially selected instances. (See Chapter 9 for a detailed discussion of the undergraduate college viewpoint.)

Discussion conclusions

All things considered, the evaluation of the intellectual qualities of applicants, although difficult and by no means successful enough to evoke a feeling of complacency, is thought to be reasonably well handled. The fact that the academic mortality in our medical schools is so relatively low attests

[6]Within the last few years the AAMC has established a program of reporting to undergraduate colleges the full four-year accomplishment of students who entered medical schools from that college during a given year. In another AAMC report to undergraduate colleges the disposition of all applicants to medical schools is reported along with a report of the first-year grade level of those who were accepted for admission to a medical school.

to the fact that most students admitted are intellectually competent enough to complete the medical curriculum satisfactorily. Indeed, among those who fail to satisfy the academic requirements are a fair number of students whose intellect is adequate but whose effectiveness is critically decreased by other factors, particularly emotional ones.

Throughout the round-table discussions in all Topic areas the difficulty in separating intellectual and nonintellectual characteristics of applicants was emphasized. As stated at the beginning of this chapter, in actual practice admissions committees are concerned with the over-all candidacy of applicants and not only one facet of it. There are always students with demonstrated superior intellects but with undesirable or ill-developed personal qualities. Conversely (and more commonly) there are the very attractive individuals with winning personalities but without demonstrable requisite intellectual ability. In cases such as these decision is often difficult and a certain irreducible error in judgment is involved. Part III of this book touches on many of these problems in discussing the appraisal of nonintellectual characteristics.

Further study of the methods of evaluating the intellectual capacities of medical school applicants is in order, and it is to be hoped that improvement in selection techniques will be forthcoming as a result of the ideas discussed at the Institute.

PART III

The Nonintellectual Characteristics of Applicants

PAGE

Chapter 4. *Appraising Nonintellectutal Characteristics* 47
by Joseph J. Ceithaml

Chapter 5. *The Interview as One Tool for Selection (A Symposium)* 60

A. A Brief Survey of the Interview 60
by Joseph Zubin

B. The Selection of Medical Students via the Psychiatric Interview 67
by Joel S. Handler

C. The Interview as a Selection Tool for Industry 72
by Francis W. Hibler

D. A Critique of the Interview 78
by E. Lowell Kelly

Chapter 6. *Appraising Nonintellectual Characteristics by Formal Psychological Techniques (A Symposium)* 85

A. A Brief Survey of the Use of Formal Psychological Tools .. 85
by Woodrow W. Morris

B. Possible Contributions of Psychological Testing of the Nonintellectual Characteristics of Medical School Applicants 88
by Daniel H. Funkenstein

C. The Use of Objective Personality Tests in Selection of Medical Students 112
by William Schofield

D. The Use of Projective Tests in the Assessment of Medical School Applicants and Students 120
by C. R. Strother

CHAPTER 4

Appraising Nonintellectual Characteristics

BY JOSEPH J. CEITHAML

Dean of Students, Division of Biological Sciences, The University of Chicago

IN THE SELECTION of students for admission into medical school, admissions committees generally evaluate the intellectual capabilities of an applicant first. Once, however, it has been established that the applicant possesses the necessary intellect for the study of medicine, committees consider the equally important but more elusive nonintellectual characteristics of their scholastically qualified applicants.

Table 4.1 presents a list of the most frequently considered of these personal and social qualities and shows the order of their importance as reported by admissions committee members and by participants in the 1956 AAMC Institute on The Appraisal of Applicants to Medical Schools. It is clearly evident that some of the characteristics *valued* most highly by medical schools are those which they have least confidence in evaluating.

Intellectual characteristics and academic achievement are likewise listed in Table 4.1. It is noteworthy that these two intellectual factors stand out as being evaluated with considerable confidence—in sharp contrast with such items as emotional characteristics, character and integrity, and motivation for a career in medicine. For the nonintellectual characteristics, there appears to be a negligible correlation between the recognized importance of the factors and the degree of confidence in their evaluation.

Table 4.1 reports the results of the pre-Institute survey of Institute participants and the similar questionnaire that was sent to medical school admissions committee members. Responses of the two groups were nearly identical. When the student characteristics are rank-ordered according to their reported importance, the agreement between the two respondent groups is almost perfect, with a rank-order correlation of .99, as shown in Table 4.2. For reported degree of confidence in evaluating the characteristics, the rank-order correlation between the two groups is .96, as shown in Table 4.3. (In many other instances the response from the two groups was so similar that data from only one group are tabulated in these pages.)

The tables above present ample evidence of a recognized need for improving the evaluation of nonintellectual student characteristics, and Institute planning received further impetus along this line because the second most popular "write-in" suggestion in the questionnaire returns was the evaluation of personal and social characteristics of applicants, particularly character and motivation.

How does one go about this important but difficult task of evaluating the nonintellectual characteristics of medical applicants? Both the Institute discussions and the pre-Institute research indicate that the problem is ap-

TABLE 4.1

IMPORTANCE OF APPLICANT CHARACTERISTICS VS. CONFIDENCE IN THEIR EVALUATION

Applicant characteristic	Committee members' ratings				Participants' ratings			
	Importance		Confidence		Importance		Confidence	
	Mean scale value*	Rank	Mean scale value*	Rank	Mean scale value*	Rank	Mean scale value*	Rank
Character and integrity	1.09	1	2.14	6	1.08	1	2.16	6
Intellectual characteristics	1.10	2	1.61	2	1.08	2	1.47	2
Academic achievement	1.27	3	1.34	1	1.13	3	1.21	1
Emotional characteristics	1.37	4	2.21	8	1.26	4	2.17	7.5
Initiative	1.51	5	2.23	9	1.52	7	2.20	9
Personality characteristics	1.52	6	1.98	5	1.39	5	1.99	4
Motivation toward a career in medicine	1.55	7	2.43	13	1.47	6	2.52	12.5
Breadth of interest	1.72	8	1.87	4	1.64	8	2.17	7.5
Strength of drive for academic achievement	1.79	9	2.16	7	1.73	9	2.06	5
Nature of interest in medicine	1.90	10	2.42	12	1.91	10	2.52	12.5
Social characteristics	1.98	11	2.30	11	1.97	11	2.32	11
Philosophy of life	2.11	12	2.58	14	2.09	12	2.54	14
First impression in interview	2.28	13	2.28	10	2.15	13	2.24	10
Physical characteristics	2.51	14	1.69	3	2.41	14	1.73	3
Rank order correlation†		.44				.46		

*The applicant characteristics with the smallest mean scale value were considered most important or most confidently evaluated by the respective respondent groups. Scale values of 1, 2, 3, and 4 were arbitrarily assigned to the response categories: Much, Some, Little, and None.

†These correlation coefficients were not significantly different from zero at the .05 level. The standard error of rho for 14 pairs of scores =.2772.

TABLE 4.2

RELATIONSHIP BETWEEN IMPORTANCE RANKINGS OF APPLICANT CHARACTERISTICS FOR TWO RESPONDENT GROUPS

Applicant characteristic	Importance	
	Participants' rank*	Committee members' rank*
Character and integrity	1.5	1
Intellectual characteristics	1.5	2
Academic achievement	3	3
Emotional characteristics	4	4
Initiative	7	5
Personality characteristics	5	6
Motivation toward a career in medicine	6	7
Breadth of interest	8	8
Strength of drive for academic achievement	9	9
Nature of interest in medicine	10	10
Social characteristics	11	11
Philosophy of life	12	12
First impression in interview	13	13
Physical characteristics	14	14
Rank order correlation†	.99	

*See first footnote to Table 4.1.

†This correlation is significantly different from zero at the .05 level. The standard error of rho for 14 pairs of scores = .2772.

TABLE 4.3

RELATIONSHIP BETWEEN CONFIDENCE IN EVALUATION RANKINGS OF APPLICANT CHARACTERISTICS FOR TWO RESPONDENT GROUPS

Applicant characteristics	Confidence	
	Participants' rank*	Committee members' rank*
Character and integrity	6	6
Intellectual characteristics	2	2
Academic achievement	1	1
Emotional characteristics	7.5	8
Initiative	9	9
Personality characteristics	4	5
Motivation toward a career in medicine	12.5	13
Breadth of interest	7.5	4
Strength of drive for academic achievement	5	7
Nature of interest in medicine	12.5	12
Social characteristics	11	11
Philosophy of life	14	14
First impression in interview	10	10
Physical characteristics	3	3
Rank order correlation†	.96	

*See first footnote to Table 4.1.

†This correlation is significantly different from zero at the .05 level. The standard error of rho for 14 pairs of scores = .2772.

proached by different schools in a variety of ways involving a diversity of formal and informal appraisal techniques. In general, however, there are four main sources of information, considered usually in the following order:

1. The application form itself
2. Premedical advisory reports from the undergraduate colleges
3. Psychological tests
4. Personal interviews

Each of these sources of information about the applicant was considered at the 1956 Institute in terms of its usefulness and its limitations in the evaluation of nonintellectual characteristics of medical school applicants.

Application forms

Application forms for admission to medical school contain a wide variety of questions, and in addition usually request a written essay, or autobiographical sketch, in an effort to secure information regarding the character, integrity, leadership qualities, and sincerity of motivation of the applicant (Table 4.4). Frequently the information regarding nonintellectual characteristics which appears in the completed application form is superficial or merely suggestive. Usually, much more meaningful information can be obtained from other sources.

Premedical advisory reports

The premedical advisory reports sent by the undergraduate schools play an important role in the evaluation of these characteristics (Table 4.5). These reports include not only letters from the premedical committee or premedical advisor, but frequently individual letters from the student's

TABLE 4.4

INFORMATION REQUESTED ON APPLICATION FORMS BY MEDICAL SCHOOLS

Information on forms	% of 90 schools
Specific items	
Date of birth	100
Schools previously attended	99
Name of parent or guardian	98
Dates of attendance at previous schools	97
Home address	97
Present address	93
Previous degrees earned	93
Photograph	89
Place of birth	87
Have you taken the MCAT?	83
Were you ever previously enrolled in medical school?	81
Address of parent or guardian	80
Occupation of parent or guardian	79
Date on which MCAT was taken	79
Military service	79
Plans for financing medical education	78
In which medical school were you previously enrolled?	76
List physical handicaps	68
Dates of previous attendance in medical school	66
Occupation since last attendance in school	62
Have you applied to this medical school before?	60
Draft status or classification	52
Place where MCAT was taken	52
Branch of military service	49
U.S. citizenship	44
Extracurricular activities	43
Dates of military service	40
Any previous dismissals from school?	38
Academic honors received	38
Public law entitlements, if veteran	36
Telephone number	32
Age	31
Number of children	31
Summary of undergraduate courses	29
Previous attendance at professional (nonmedical) schools, and names	29
Number of dependents	28
Dates of previous attendance at professional (nonmedical) schools	27
Necessity of part-time work	27
Reasons for dismissals from school	26
Courses in organic chemistry previously taken	24
Church affiliation or religion	21
Name of college or university now attending	21
Eligibility for readmission to any medical school enrolled in previously	20
Nationality	17
Marital status	17
Length of residence in state of school to which application is made	17
Names of relatives who have attended school to which application is made	14
Field of concentration at previous schools	12
Date dismissed if previously dismissed from school	12
To which other medical schools have you applied?	12
Name and/or address of premedical advisers	12
Name of school dismissed from, if ever dismissed	11
Length of military service	11
Any discontinuation of study because of physical handicap	11
If not a citizen, steps taken to become one	9
Request for essay	
Essay required	54
Essay to be handwritten	38
State reasons for studying medicine	37
Include statement of extracurricular activities	19
Essay has a word limit	18
State reasons for applying to this medical school	14
Include any academic honors	3
Request for references	
State names of character references	30
State names of academic references	27
State names of professional references	18
Blanks for academic references included	28
Blanks for character references included	3
Blanks for professional references included	1
Request for health data	
Health report forms included	24

instructors and, on occasion, a letter from his dormitory head resident.

Although the participants at the Institute placed appreciable value upon the premedical report in appraising the applicant's character, integrity, leadership qualities, and scholastic achievement, they had much less confidence in the report's appraisal of the applicant's motivation for the study of medicine or his suitability as a potential physician. This lack of confidence, in essence, is not a reflection upon the premedical advisory groups, but rather upon the Admission Committee members and Institute participants themselves; as shown in Table 4.1, it is apparent that these people have relatively little confidence in their own ability to evaluate the important characteristic of "motivation toward a career in medicine."

It was the consensus of the participants at the Institute that premedical reports are valued highly by admissions committees in their evaluation of nonintellectual characteristics of applicants. It is highly desirable to maintain good rapport between admissions committees and premedical advisory groups, and the latter must be made aware that their reports are not only appreciated, but highly useful to admissions committees (Table 4.6). Various ways of improving this rapport were mentioned, including visits to the colleges by representatives of admissions committees, invitations to

TABLE 4.5

VALUE OF PREMEDICAL ADVISORY REPORTS IN APPRAISING VARIOUS APPLICANT CHARACTERISTICS

(Participants group)

Applicant characteristic	% of 91 participants citing value of report					
	Not obtained	None	Little	Some	Much	No response
Character	2	0	10	51	35	2
Integrity	2	0	9	55	32	2
Motivation for the study of medicine	2	7	30	47	11	3
Leadership qualities	3	0	8	54	33	2
Scholastic achievement	2	1	4	23	68	2
Scholastic potential	3	0	8	56	31	2
Suitability as a potential physician	4	10	28	48	8	2
Comparison of applicant with other applicants or with medical students from the same premedical college	8	0	3	36	51	2
Weaknesses and compensations, if any	6	0	15	49	28	2
Overall rating (e.g., highly recommended, recommended with reservations, not recommended)	2	0	5	35	56	2
Other	1	0	0	1	6	92

advisers to visit the medical school, distribution of information leaflets, and the like. From Table 4.6 it appears that the extent to which admissions committees value a premedical report varies directly with the degree of experience of the committee with the recommendation policy of that premedical group. It is of interest to note in Table 4.7 that admissions committees in general expressed a marked preference for premedical *committee* report on an applicant, rather than an individual adviser's or instructor's report. It was pointed out repeatedly at the Institute that premedical advisers appreciate receiving periodic reports regarding their students after they have entered medical school. Moreover, the reliability of preprofessional recommendations has been found to be increased when the advisers receive such progress reports on their former students. This feedback mechanism should be encouraged.

Constructive criticism of the usual premedical report was offered by participants, both in their responses to the pre-Institute questionnaire and in the round-table discussions at the Institute itself. It was suggested that whenever possible the premedical advisory groups include in their reports a comparison of each applicant with the others from the same college applying to the same medical school. Moreover, if former students from the college are in attendance in a particular medical school, a comparison of an applicant with these medical students proves most helpful to the admissions committee of that school. A strong plea was made by partici-

TABLE 4.6

EXTENT TO WHICH VARIOUS FACTORS INFLUENCE EVALUATION OF PREMEDICAL REPORTS

(Participants group)

Influencing factor	% of 91 participatints citing extent of influence					
	Not applicable	None	Little	Some	Much	No response
Candidness of report	1	0	1	17	80	1
Documentation of statements	9	1	8	26	53	3
Degree of rapport between admissions committee and the premedical group or adviser	2	0	4	22	70	2
Experience with recommendation policy of the premedical group or adviser	2	0	0	8	88	2
Other	0	1	0	0	8	91

TABLE 4.7

PREFERRED TYPE OF APPLICANT APPRAISAL FROM PREMEDICAL COLLEGES
(Participants group)

Preferred type of appraisal	% of 91 participants
Committee Appraisal	41
Individual letters	8
Both committee appraisal and individual letters	7
No preference	8
Depends	34
No response	2

pants at the Institute for more help from premedical advisers in evaluating medical applicants. At the same time it was recommended that deans and presidents of colleges need to be reminded of the extraduty functions of premedical advisers—and of their value, not only to the colleges, but to medical schools and to society as well.

Psychological tests

Although personality and vocational interest tests are little used for the evaluation of medical applicants at the present time (see Tables 4.8 and 4.9), there is nevertheless considerable interest among the medical schools in these tests. The use, value, and limitations of psychological tests in the evaluation of nonintellectual characteristics of applicants is discussed in considerable detail in Chapter 6.

The interview

One of the techniques most widely used by the medical schools to gain knowledge regarding the nonintellectual characteristics of applicants is the personal interview, as indicated in Table 4.9. Considerable information about interview methods and the interviews themselves was obtained from the questionnaire sent to all participants before the Institute and much of this material can be found in the Appendix in Tables A.17 to A.30.

Students who entered medical schools in September 1956 were also surveyed by questionnaire; they were asked to express their views on the admissions procedures practiced by medical schools. Even though most of these students in their questionnaire responses rated the interviews as "satisfactory" or better, as reported in Table 4.10, it is evident from Table

TABLE 4.8

PSYCHOLOGICAL TESTS: PRESENT AND PLANNED USE IN EVALUATING NONINTELLECTUAL CHARACTERISTICS
(Participants group)

Name of test	% of 91 participants indicating use of test				
	Tried and dropped	Now in use	Planning to use	Not planning to use	No response
Strong Vocational Interest Blank	2	4	2	52	40
Minnesota Multiphasic Personality Inventory	4	7	2	51	36
Individual Rorschach	0	2	1	56	41
Group Rorschach	6	0	1	56	37
Kuder Preference Record	2	2	1	55	40
Cornell Medical Index	0	0	1	59	40
Other	1	2	5	2	90

TABLE 4.9

PRESENT USE OF VARIOUS SOURCES OF INFORMATION IN EVALUATING NONINTELLECTUAL CHARACTERISTICS
(Participants group)

Source of information	% of 91 participants citing extent of use					
	None	Little	Some	Much	Not Obtained	No Response
The personal interview	0	3	23	72	1	1
The psychiatric interview	7	27	21	4	40	1
Objective personality test results	13	16	2	4	62	3
Projective personality test results	17	11	1	2	66	3
Vocational Interest test results	17	15	7	1	59	1
Ability and achievement test results	9	9	26	29	25	2
Premedical committee, or premedical adviser evaluations	0	2	29	68	0	1
Written evaluation by premedical instructor(s)	1	8	39	50	1	1
Other written evaluation	5	23	18	7	3	44
Health report from student	7	22	37	16	17	1
Health report from physician	4	8	25	40	22	1
Extracurricular activities	2	17	56	22	2	1
Chronological continuity of education through high school and college	11	25	41	21	1	1
Work experience	9	27	53	8	2	1
Information concerning financial need	10	25	49	12	3	1
Photograph	14	42	28	13	2	1
Autobiographical sketch	2	16	25	14	42	1
Essay on selected topic (other than autobiography)	6	4	16	3	69	2
Other data from application blank	3	6	25	10	1	55
Other nonintellectual appraisal from source not mentioned above	4	6	4	6	1	79

4.11 that the interview was the one aspect of the application procedure judged by the students as being handled least well by the medical schools. Where an interview was rated as "poor" by the students, the reasons cited for this rating are revealing and may be seen in Table 4.12. It appears that an appreciable number of the students believed that the interview was too short and that the interviewer appeared to lack interest in the interview.

Because of the widespread interest concerning the interview, a symposium on "The Interview as One Tool for Selection" was presented at the Institute and is reproduced here in Chapter 5. Dr. Joseph Zubin, moderator of this symposium, introduced the subject with a warning that one should not expect too much from the interview. He stressed that the interview can be a valuable method for assessing personality factors, but that it should be used wisely. He traced the development of the interview as a psycho-

TABLE 4.10

STUDENT RATING OF THE INTERVIEW
(Medical freshmen group; multiple response)

Impression of each interview experienced	% of 756 freshmen
Excellent	63
Good	42
Satisfactory	28
Poor	25
No response	9

TABLE 4.11

STUDENT OPINION ON LEAST WELL HANDLED ASPECTS OF APPLICATION PROCEDURE
(Medical freshmen group)

Aspect handled least well	% of 756 freshmen
Interview	26
Notification of student's acceptance or rejection	13
Dissemination of information about school and method of application	6
Evaluation of qualification and letters of recommendation	6
Content or clarity of application form	5
Insufficient stress on non-academic factors	5
Acknowledgement of correspondence	4
Testing program	1
Other	8
No complaints	7
No response	19

TABLE 4.12

STUDENT REASONS FOR RATING THE INTERVIEW "POOR"
(Medical freshmen group)

Reasons cited for rating interview "poor"	Frequency*
Interview too short	47
Group interview too competitive, told almost nothing about the individual	39
Interviewer lacked interest	31
Interview unfriendly, no personal interest	29
Asked irrelevant questions. Duplicated application form	25
Too much formality and pressure, causing student to be tense	19
Interviewer poorly qualified, inexperienced, or hostile	16
Interviewer attempted to confuse student or was sarcastic	13
No attempt made to understand student's character	10
Too many interviewers	8
Interview long and pointless	6
Did not follow time schedule	6
Interviewer did most of the talking, often on irrelevant topics	5
Interviewer acted as if he was doing student a favor	4
Interviewer had pre-determined idea of action to be taken	3
Appointment was canceled at last minute	3
Lack of communication	3
Miscellaneous	32

Selected comments

"Interviewers took very little time (approximately ten minutes each). One interviewer stated that applicant (female) was interested only in marriage with a doctor."

"A walk on a long carpet, under the fishy, antagonistic stare of Dean ——, is not conducive to a friendly attitude. Also abrupt and unhelpful replies to questions."

"I realize that interviews are psychological tests, but this interview was insulting, disheartening, and misleading. . . ."

*Of the total group of 756 students, 189 rated interviews they had experienced as "poor."

logical tool, described the basic characteristics of the interview, considered the tactics employed by the interviewer, and called attention to errors that should be avoided. Dr. Zubin's introduction appears as Section A of Chapter 5.

Dr. Joel S. Handler, discussing the use of the psychiatric interview, related his experiences in interviewing first-year medical students for the purpose of evaluating their motivation for the study of medicine and their interests, anxieties, and problems. He described the various types of students as they revealed themselves through interviews; he noted that the majority of these students appeared to be emotionally constricted conformists. (See Section B of Chapter 5.)

Dr. Francis W. Hibler, whose presentation appears as Section C of the following chapter, spoke of use of the evaluative interview, coupled with psychometric tests, in the selection of executives for industry. He pointed out two basic factors with which the interviewer for industrial selection must be familiar: (1) the qualities essential for success in a given position and (2) the way of life (modus operandi) of the particular company. Dr. Hibler listed five personality areas in which evaluations are made: intellectual effectiveness, maturity and stability, skill in human relations, insight, and ability to organize and direct activities—these are considered crucial areas for a top executive and may very well be applicable for the physician or the medical researcher.

Dr. E. Lowell Kelly presented a somewhat different point of view, for he was critical of the use of the interview as a selection device. He reported

that, although the interview is widely and confidently used as a technique of personnel selection, there is virtually no published evidence of its predictive validity. Dr. Kelly's presentation will be found in Section D of Chapter 5.

Stimulated by Dr. Kelly's pessimistic evaluation of the interview, the participants at the Institute discussed extensively the purpose of the interview in the medical school admissions procedure. It was emphasized that as a rule the interview is not employed as a means of predicting scholastic success in medical school. Indeed, it was generally recognized that the combination of the applicant's academic performance in college, his scores on the *Medical College Admission Test,* the premedical advisory report, and letters of recommendation on his behalf yields sufficient information to enable the admissions committee to decide whether or not a particular student will be able to do satisfactory scholastic work in medical school. (See Chapter 3.) On the other hand, the interview is widely used by medical schools for a variety of purposes, outlined as follows:

1. The interview allows an admissions committee an opportunity to verify and clarify information obtained about the applicant from the application form and from other sources. In this and in other similar ways, the interview is of value to the admissions committee (Table 4.13).
2. The interview allows the student an opportunity to explain in person any unique or complicated aspects of his application, and at the same time it affords him an opportunity to learn more about the medical school which has invited him for interviews (Table 4.14).
3. Where a medical school cannot accept all of its otherwise qualified applicants for admission, it may use the interview technique to decide which applicants would seem most likely to profit from that school's educational program.

TABLE 4.13

OPINION OF INSTITUTE PARTICIPANTS ON POTENTIAL VALUE TO THE SCHOOL OF THE PERSONAL INTERVIEW
(Participants group)

Interview's value to school	% of 91 participants indicating extent of value				
	None	Little	Some	Much	No response
It allows the admissions committee an opportunity to verify and clarify information obtained about the applicant	0	1	33	65	1
It permits the committee to ascertain whether the candidate possesses any obvious physical or mental handicaps (speech impediment, tics, etc.)	0	1	19	79	1
It affords the interviewer an opportunity to delve into an applicant's motivation for the study of medicine	1	18	41	39	1
It gives the interviewer an opportunity to give the applicant detailed information about the medical school	6	24	46	23	1
It allows a first-hand evaluation of the applicant's intellectual abilities	2	23	57	17	1
It permits an evaluation of the applicant's cultural breadth	0	13	57	29	1
It affords an opportunity to assess the applicant's ability to withstand stress	8	35	42	13	2
It permits observation of the applicant (poise, frankness, bearing, etc.)	0	0	32	67	1
It permits an assessment of the skill of the applicant in personal relationships	3	10	61	25	1
Other	0	0	2	3	95

TABLE 4.14

OPINION OF INSTITUTE PARTICIPANTS ON POTENTIAL VALUE TO THE STUDENT OF THE PERSONAL INTERVIEW

(Participants group)

Interview's value to student	% of 91 participants indicating extent of value				
	None	Little	Some	Much	No response
It may afford him an opportunity to inspect the academic and non-academic facilities of the medical school	1	19	47	32	1
It permits him to question the interviewer regarding details concerning the medical school	0	7	43	49	1
It allows him an opportunity to explain in person any unique aspects of his application	0	2	33	64	1
It affords him an opportunity for a personal acquaintance with someone at the medical school	4	18	43	34	1
Other	0	0	5	6	89

4. The interview may also be used to detect gross deficiencies in personality and emotional stability, i.e., to assess superficially the mental health of the applicant. Where emotional problems were a consideration, the participants were in agreement that in such cases (and preferably only in such cases), the applicant should be referred to a psychiatrist for an extensive psychiatric interview.
5. The interview establishes good personal contact between members of the admissions committee and the applicant, which later could be continued and extended to the benefit of the student if he is accepted and attends that school.
6. At least one school interviews wives of all accepted students in an effort to anticipate possible sources of future conflict and to obtain additional information regarding the personal characteristics of the husband students.
7. At many schools, the interview is considered to be a two-way process —the school gets to know the student and the student gets to know the school. At some schools, after his interviews, an applicant may be taken on a tour of the medical school by medical students. He meets other students on the campus and may even be served a meal as guest of the school.
8. The interview is used extensively to promote good public relations between the medical schools and parents, applicants, state legislatures, and also future medical applicants. In this area of public relations some of the participants indicated that they used the interview to advise rejected applicants about seeking other fields of study. It was thought that the degree of anxiety of rejected applicants could thus be appreciably reduced; further this action might do much in allaying the apprehension of future medical applicants who cannot help but be affected by the anxieties usually exhibited by rejected applicants.

During the course of the round-table discussions that followed the symposium on the interview, a suggestion was made that medically oriented professional interviewers be trained and given full-time responsibility in the selection of medical students; this proposal was not widely supported. It might be added that it was generally felt there was little advantage in using

the psychiatrist for routine short-duration interviews in assessing the emotional makeup of applicants. It was thought that psychiatrists can be most helpful on admissions committees in the role of consultants.

The view was also expressed that before one can test whether the interview can be used to predict future performance of medical applicants, it will be necessary to establish criteria of success in medicine. It was further agreed that these criteria, in the final analysis, must be established by a mutual evaluation process effected by the physicians themselves.

Two important problems which concern medical school admissions committees, and which received considerable attention at the Institute, involve the evaluation of an applicant's motivation for the study of medicine and the evaluation of his mental health.

Motivation for the study of medicine

As mentioned previously, this nonintellectual characteristic is considered to be of great importance in the selection of medical students, although admissions committees express relatively little confidence in their ability to evaluate the motivation of an applicant (Table 4.1). It is difficult for a student to recognize, let alone verbalize, his motivations, many of which probably are emotional in origin. The question also arises as to which brings the greater reward to the applicant—an honest but perhaps naive statement of conscious motivation, or a shrewd and perhaps superficial adaptation to the suspected requirements of the medical school as reflected by the interview.

It is recognized by admissions committees that outside pressures often affect an applicant's motivation. Parental wishes, anticipated social prestige, and expected financial rewards on occasion may influence a student to select medicine as a field of study, without furnishing him the necessary drive to assure his success in medical studies, let alone in a medical career.

Nevertheless, a distillation of the many comments made by the participants at the Institute reveals their belief that the very filing of an application for admission indicates motivation for medicine and that intellectual, academic, and extracurricular social achievements indicate an efficient and mature harnessing of this motivation. Beyond that, meaningful professional motivation should be developed during medical training.

Among the participants at the Institute, it seemed to be the general opinion that those students should be selected for medical study who possessed a "service orientation," and who are therefore chiefly interested in helping people. It was pointed out, however, that our American society is largely "achievement-oriented" and measures success mostly in terms of material values. Since students reflect the society from which they come, the question thus arises: Would it be possible to find in our society a sufficient number of students with service-related values to fill our medical school classes annually? This poses a perplexing problem: Should we accept society as it is—try to understand it and live with it—realizing that we shall continue to produce many doctors who are not service-oriented, or

should we strive to change the values of the students after they enter our medical schools?

The evaluation of an applicant's motivation for the study of medicine is understandably difficult; although it was suggested that perhaps the *Strong Vocational Interest Blank* and the so-called Career Interview might prove to be valuable in this regard. The *Strong* is discussed further in Chapter 6. The Career Interview is one focused upon the development of vocational interests in the candidate from his earliest vocational preferences to the time of the interview.

Mental health

The evaluation of emotional characteristics and the general matter of mental health of applicants likewise are of great importance in the consideration of medical applicants; and consequently they too were the subject of much discussion at the Institute. It is interesting, first of all, to note that there was, with a few exceptions, general agreement at the Institute that a diagnosis of mental illness per se should not exclude a candidate from consideration. Although a history including a frank psychotic episode should rule out an applicant, some controlled anxiety drive seems to be desirable. It was agreed that some personal experience with anxiety and neurotic symptomatology might enable the doctor to empathize better with his patient.

In essence it appears it might be well to give more thought to how much psychopathology could safely be tolerated in an otherwise well-qualified applicant, rather than strive to exclude all potentially unstable candidates from consideration. It was proposed by some that the premedical college student health service, where such a service exists, be requested to furnish information regarding the mental health of applicants. However, there was serious question as to whether such information could be supplied without a breach of medical ethics. On the other hand, observations by undergraduate instructors of the reactions of students to various disappointments and difficulties could be of great value in assaying the emotional stability of applicants. Laboratory courses especially provide possibilities for relatively long periods of observation.

The advisability of accepting recommendations for admission of a candidate from his psychotherapist was discussed in several round-table sections. Here, it was uniformly agreed that because of the close interpersonal relationship between such a student and his psychiatrist, and because of the identification of the psychiatrist with the success or failure of his patient, it is not advisable to accept such recommendations. Finally, food for thought was presented in the form of a suggestion that, in view of the predicted increase in the number of applicants in the coming years, it might be profitable to consider the use of some such test as the *Minnesota Multiphasic Inventory* to detect emotional problems in applicants as a substitute for time-consuming personal interviews or as a supplement to the personal interview.

Conclusion

From both the pre-Institute survey results and the discussions at the Institute itself, it is evident that the so-called nonintellectual characteristics of medical applicants—the elusive personal and social traits and motivational factors—share importance with the more readily measurable intellectual traits in the appraisal of applicants to medical schools. However, there appears to be a need for clarifying some of the nonintellectual criteria and improving this aspect of the evaluation process. Of the various sources of information available, the premedical advisory reports appear at the present time to be most useful in the evaluation of the nonintellectual characteristics of medical applicants.

CHAPTER 5 A Symposium

The Interview as One Tool for Selection

THE SYMPOSIUM ON the interview is presented in this chapter in the same sequence as it occurred at the Institute. To set the keynote for the three points of view represented in the following pages, moderator Joseph Zubin has contributed a brief overview of the development of interview techniques. At the Institute Dr. Zubin summarized his introductory remarks on the current status of this selection device under six main points —these are listed immediately below, since it may be helpful to readers to keep his considerations in mind in reading this chapter.

1. The interview is at once the most pervasive and the most treacherous tool for selection now in use.
2. As long as we have no objective way of determining our criteria for good physicians of whatever variety, and as long as we have no objective ways of evaluating some of the traits that are allegedly prerequisites for becoming a good physician, the interview is the only tool we have for estimating traits. Let's make the best use of it.
3. There are many pitfalls in the interview, some of which can be circumvented by training, others only by long experience, still others perhaps never, except through inborn genius.
4. In order to improve the interview, its global use for measuring everything must be discontinued. Instead, it should be put to work on specified, limited objectives via the focused interview technique.
5. Certain psychological techniques are already available for improving the interview and these should be experimented with in selected situations to determine their efficacy for selection and their adaptation to the selection of medical students.
6. Nothing, however, can substitute for long-range follow-up studies to determine criteria for success in the various fields of medicine existing today.

A. A Brief Survey of the Interview

BY JOSEPH ZUBIN*

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A REVIEW OF THE returns of the pre-Institute surveys indicate that the personal interview is the most frequently used instrument in the evaluation of the candidate for medical school—it is also the most frequent cause of griping in the student body (see Tables 4.9 and 4.11 in Chapter 4). But, despite the interview's prevalence, much doubt exists in the minds of

*The author wishes to acknowledge the kind helpfulness of two of his associates at the New York State Department of Mental Hygiene: Dr. Eugene I. Burdock, Associate Research Scientist (Biometrics), and Dr. Kurt Salzinger, Research Scientist (Biometrics).

at least some of the Institute participants regarding the validity of this instrument in the selection of candidates for admission. This ambivalence toward the interview arises in the selection not only of medical students but also of other professional students and of personnel in industry; it arises in all the varied areas where the interview is customarily applied.

Paradoxically, the very people who are most eloquent about the shortcomings of the interview would never hire a secretary without an interview, nor would they ever consider engaging a research assistant or selecting a member of the medical faculty without a personal interview. Yet in all these situations the objective factors for selection could very readily be obtained either by standardized tests or from public records and papers. This paradox about the interview has been noted by many workers, including the contributors to the present symposium, and it has puzzled me for a long time—personally I would rate the challenge implicit in this paradox as the chief business of this symposium.

I am told that Dr. Aura Severinghaus of Columbia attended a similar conference about selection techniques for medical students a year or so ago in London, England. He found that he was the only one there who had anything good to say for the interview. Everyone else claimed that it was not of much value, until one New Zealander arose and said, "Gentlemen, if I wanted to get married and you had 20 willing maidens in this room and gave me all the tests in the world about them, I still would like to talk to each of them before I selected one as my wife."

Historical background

When one reviews the history of science, it becomes quite clear that the interview, or its essence, conversation, was the first tool of scientific investigation. Long before we had yardsticks, thermometers, or clocks, man depended on the subjective responses reported by his peers or observed by himself for measuring the physical universe. This primitive, nominal measurement is still preserved in such bipolar adjectives as heavy–light, warm–cold, long–short, and so on, and their counterparts in other languages. Only the provision of criteria external to the subjective estimates of human beings has made it possible to objectify the measuring of distance, heat, time and so on.

In psychology, too, the measurement of human behavior was initially self-referred, and this nominal stage in psychological measurement reached its climax with the checklist of descriptive adjectives, such as that of Cattell. Even today with the availability of a variety of objective tools the bright student in a class is the one most like the instructor, while the dull fellow can be identified by his failure to appreciate the professor's point of view. Although this system of self-reference works pretty well most of the time, it occasionally results in gross incongruities. Thus Evariste Galois, who invented the mathematical theory of groups, was declared to be hopelessly incompetent by his professors and was refused admission to the Sorbonne.

The concept of personality originally included all the traits and characteristics that had anything to do with the evaluation of human behavior including intelligence, interests, and aptitudes. But then Binet introduced the intelligence test, which Stern subsequently capped with that ubiquitous index of intellectual efficiency, the IQ. Subsequently E. K. Strong devised a measure of vocational interests by weighting the contrasting preferences of different occupational groups on an interest questionnaire. About the same time, R. S. Woodworth brought out the first personality inventory for the assessment of personal adjustment; Carl Seashore developed a measure of musical aptitude, and other special aptitudes were found to be accessible to independent assessment.

Through these developments personality gradually lost its "intelligence," then its "interests," and finally even its "aptitudes." Nevertheless, the concept of personality could not be dispensed with, because there were too many individual differences left in behavior after the measurable components had been accounted for. These could only be evaluated by means of conversation or interview. That is why the interview has persisted despite the fact that it has suffered from a social lag in comparison with the other instruments we use for the evaluation of behavior. For, while standardized tests, psychophysical techniques, and psychological methods have become more and more sophisticated, the interview has remained a vague, global assessment device—a catch basin for the residue of behavior that filters through the network of objective measures.

Components of the interview process

In order to see how this bear cub, the interview, may be licked into respectable scientific shape, one must first analyze the interview process into its components and learn how to manipulate the variables involved so as to elicit the kind of information desired. The four essential features of the interview are:

1. It is a face-to-face situation
2. It has a specific purpose
3. It uses interpersonal conversation as a medium of communication
4. The relationship between the two interlocutors is not reciprocal (i.e. the roles of interviewer and interviewee are not interchangeable)

The elimination of any one of these features necessarily reduces the interview to a degenerate form (mathematical not human degeneration). For example, eliminating the face-to-face situation, without disturbing any of the other elements, withdraws certain intrinsic gestural cues. The effects of cue reduction are evident in the telephone interview or at the confessional. Unilateral modification of the face-to-face situation, as when one of the two participants is unaware that he is being observed, reduces the interview to an observational procedure in which both verbal and nonverbal behavior are recorded by an observer. The result of removing conversational give-and-take with the retention of the face-to-face situation is seen in the lecture or in the psychoanalytic session. The removal of conversation and substitution of written responses reduces the interview to

a supervised test session. If specific purpose is absent, the interview is reduced to conversation or gossip or bull session.

No systematic variation of the essential features of the interview has thus far been attempted. However, for our purposes today, it might be well to limit ourselves to one important feature of the interview, namely its specific purpose. The purpose of the selection interview ought not to be determination either of the intellectual capacities of the candidate or of any other aspects of his behavior that can be more accurately gauged by standardized tests, official records, and so on. We should reserve the interview for those things which are not attainable by any other method. And, what are these? I would like to suggest that the purpose of the interview is to gather information about the candidate's motives, feelings, attitudes, and integrity insofar as they determine his interests in medicine and his ability to deal with people.

These are factors for which no tests exist today, although perhaps some day we may be able to develop tests for them, if we obtain suitable criteria. Whether or not these factors are important for eventual success in medicine is, of course, still debatable, but it seems that the majority of the members of this Association would like to have information on these factors and that is why I draw attention to them. As for any connection between these factors and the eventual outcome of medical training, we shall have to isolate more adequate criteria of outcome before we can expect to devise tests that will be criterion-relevant. Moreover, although it is quite likely that the traits and characteristics we have mentioned will eventually be important for success in medicine, should they turn out to be unimportant, much of our present point of view about professional selection will prove to have been wrong.

If we agree that the purpose of the interview is to focus on the personality characteristics which are important and at the present time cannot be measured in any other way, the next question is: How does the interviewer elicit such information? The best answer that we can give at the present time is that the interviewer operates with the tactics and strategy of ordinary conversation. These tactics are overlearned behaviors that are reinforced repeatedly from the time when we are participating in social conversation. It is therefore very difficult to disengage oneself from the habits of ordinary conversation for the purpose of conducting an interview. That is why it is necessary to train interviewers. Only those who have explicit understanding of the techniques involved in conversation can properly manage the interview situation. Some of these techniques can be cataloged, although not all of them.

For example, if you were to observe yourself or others engaged in conversation, you would note that attitudes, feelings, and motivations were often evoked by the method of amplified agreement. Whenever the interviewer wanted to find out whether the point of view expressed by the interlocutor was really representative of the general view that he had, he would extend the statement by amplifying it. The interviewee would then either correct the amplification, ignore it, or agree with it. In this way, the limitations

of his attitudes and the tenacity with which he adhered to them would be revealed to the observant interviewer.

Other techniques are disagreement, surprise, change of tempo, and so forth, tactics we are all capable of employing and that serve us well in conversational situations. One might almost go so far as to say that the ability to adopt a variety of attitudes toward the interviewee is essential for the good interviewer.

Some pitfalls of the interview

Errors of inference often arise in the course of manipulating one's own attitudes to elicit those of an interlocutor. Interviewers may arrive at invalid conclusions because of (1) erroneous information and (2) emotional prejudices. These two kinds of errors can be moderated only by experience and training.

A third type of error is a psychological effect of the interview process itself. Thorndike pointed out long ago that when ratings of specific traits are made by means of interviews the correlations between traits are quite high, even where there is no a priori reason for assuming any relation between the traits. For example, when ratings on such traits as friendliness, studiousness, and dancing ability are correlated, the correlations are sometimes surprisingly high, even though no relation between these three traits is to be expected. This so-called halo effect is usually attributed to a generalized attitude of the rater towards the subject which modifies all of his judgments.

A fourth type of bias that has been discovered in the interview is a tendency toward stereotypy. Walter Lippmann introduced this term to describe the public's inclination to think in, and to respond to, stereotypes during political elections. Allport, who called this tendency the "labeling error," pointed out that it represents a psychological paralysis of judgment through oversimplification. For example, the assumption that students who have majored in the biological sciences make the best physicians may represent such a labeling error.

A fifth error arises from the predominance of ratings near the center of the judgment scale because of the judge's attempt to avoid extreme ratings. A rater who is not familiar with the statistical theory of distributions may not realize that if he places everybody at the mean, or at the center, his work is undone. For he has provided no information for differentiating the population.

A sixth error is the generosity effect which tends to make the rater or interviewer give the subject the benefit of the doubt. The generosity effect, when coupled with certain biases on the part of the interviewer, can often lead him astray. For example, clinical psychologists and psychiatrists often lean over backwards to give a candidate the benefit of the doubt in situations where businessmen would not hesitate to reject a candidate. Clinical experience may make us feel so much more tolerant of deviant behavior that we lose our perspective. Such relaxed standards may result in minimizing a candidate's dishonesty or other lack of integrity.

A seventh type of error is the occasional suggestive nature of interviewer questions which steer the response of the interviewee. This may happen when the interviewer has a strong bias towards a given hypothesis. The interviewer may then inadvertently suggest answers to the interviewee.

Finally, errors may arise as a result of improper weighting of the different elements of the interview when a composite picture is later assembled by the interviewer. Sometimes in retrospect a certain trait will be recalled that turned out to be crucial, although it was deemed of no significance at the time of the interview.

That these sources of error are potent in influencing the conclusions based on interviews is strictly evidenced by the results obtained in a special study of one of our medical schools. All the interviewer ratings of personality, but not the ratings on evaluation of past scholastic achievement, were negatively correlated with actual success in training. One telltale indication of why such interviews are ineffectual is the naive assumption of many interviewers that the first impression made during the interview is important. Sixty-two per cent of the admissions committee members who responded to the pre-Institute questionnaire believed this to be true (see Table 5.1). Moreover, 60 per cent of the members rated their confidence in the accuracy of their initial judgment as fairly high. Since the accuracy of first impressions was disproved several decades ago, such beliefs belong to folklore rather than to science. Unless we train interviewers to be aware of the above sources of error, negative correlations between interview and criterion are likely to keep occurring indefinitely.

TABLE 5.1

ADMISSION COMMITTEE MEMBERS' OPINIONS ON THE FIRST IMPRESSION OF AN APPLICANT IN AN INTERVIEW
(Committee members group)

Importance of first impression	% rating confidence in their first impression					% rating importance of first impression
	None	Little	Some	Much	No response	
None	2	2	1	*	0	5
Little	3	17	6	2	1	29
Some	1	9	36	4	1	51
Much	0	*	4	6	1	11
No response	*	*	*	*	3	4
Total (N = 534)	6	28	47	13	6	100

*Less than 1 per cent response.

Some interview techniques

So much for the interview in relation to our usual conversational techniques. Let me take a few moments to draw attention to some other approaches to the interview.

First, there is the practice of recording the interview for the purpose of making a content analysis in accordance with certain specified categories. Content analysis is a well-developed technique. If we could obtain tape recordings of admission interviews, we might analyze their content and play them back to the interviewers pointing out what areas were covered, what areas were missed, and what sources of error were in evidence. Correlations could then be run between the results of content analysis and

the interviewer's evaluation. I know of only one medical school that records interviews. If such records could be made available for content analysis, the whole selection process would be the beneficiary.

An experimental approach to the interview is afforded by the direct and conscious manipulation of certain elements found in all conversation. Usually we apply these techniques in an unconscious and natural way. Methods have recently been developed for varying them systmatically. Thus, in one experimental form of the interview, the interviewer varies his "input" according to a predetermined schedule. At fixed intervals during the interview the interviewer will remain silent, or interrupt the interviewee, or interfere in some other way with the smooth flow of conversation. The response of the interviewee to these conditions reveals many of his personality characteristics.

Chapple has shown such techniques to be efficacious in the selection of salesmen of ladies shoes.[1] Saslow and Matarazzo, basing their work upon that of Chapple, have demonstrated that the temporal aspects of the interview revealed characteristics of the interviewee.[2] These investigators have established the reliability of their findings in well-controlled and replicated studies.

Another experimental approach to the interview has utilized content-free speech. The procedure is to take the recording and filter out from the interviewee's voice the audible frequencies below 450 cycles per second. This is done by means of a high-pass electronic filter. The resulting speech record still yields indications of pitch, rate, and loudness—the voice qualities that are often said to be the best indicators of affect or emotion. Starkweather, Kauffman, and Soskin have been able to demonstrate correlations between speech qualities and such traits as pleasantness and aggressiveness.[3]

A more recent innovation is the focused interview, intended to elicit specific information about a given topic. For example, in our own recent work on prognosis of outcome of schizophrenia, we have been developing a technique for determining the plasticity of the patient's affective communication. As some of you no doubt know, flatness of affect is an indicator that augurs ill for outcome. Most patients with flattened affect remain in the hospital for the rest of their lives.

In order to obtain a measure of flatness, we record a type of interview like the one described here. During the first ten minutes of interview the patient is encouraged to discuss any area of his experience, while the inter-

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1. Chapple, Eliot D. "The Interaction Chronograph: Its Evolution and Present Application," *Personnel* 26, Jan. 1949.

2. Matarazzo, J. P., Saslow, G., and Matarazzo, Ruth G. "The Interaction Chonograph as an Instrument for Objective Measurement of Interaction Patterns During Interviews," *J. Psychol.*, 1956, p. 347.

3. Starkweather, J. A. "The Communication Value of Content-Free Speech," *Amer. J. Psychol.* 69, 1956, pp. 121-123.

viewer maintains a noncommittal, detached attitude. A count is taken of the number of utterances with affective words such as "like," "dislike," "love," "hate," or any that refer to a subjective feeling. During the second ten-minute period every time the patient utters a reference to some subjective feeling or affect, the examiner encourages or reinforces the utterance by saying, "Uh-huh," or "Yes." Invariably, the number of affective utterances rises precipitously. In the final ten minutes the experimenter reverts to his initial neutral tactics, so as to discourage continued expression of affect. The variation from patient to patient in ability to emit affect is most striking. We think we have obtained a measure that is at once objective and suitable for prognostic purposes.

There are implications here for the selection interview. One might, for example, focus on some aspect of the candidate's attitude or experience or inclinations. If every time the candidate made a reference to a motivational factor or to an attitude toward medicine the examiner were to say "Uh-huh" or "Yes," the record obtained in this fashion might later be quite revealing about the variety of motivation the candidate possessed, the quality of these motivations, and their relevance to later success.

A final word

The purpose of this brief survey of the development of interview techniques has been to set the stage for the three papers that follow and to suggest some approaches to interviewing that may reduce the hazards involved in using this procedure in selection. It is hoped this symposium contributes some ideas that medical schools can utilize in handling the paradoxical attitudes toward interviewing their applicants for admission.

B. The Selection of Medical Students via the Psychiatric Interview

BY JOEL S. HANDLER
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THIS DISCUSSION of the application of interview techniques to the selection of medical students by means of the psychiatric interview is based on the results of a study made by Dr. Henry Brosin, Dr. L. William Earley, Dr. William Soskin, and myself. My report is based on such data as impressions gleaned from interviews of all students in three classes of freshman medical students and available psychological test data. Some of the interviews we did placed particular emphasis on trying to find out why students dropped from school; we tried to get as many of these as possible. A number of interviews disturbed some students and brought up various needs for further discussion, so we found ourselves engaged in much more psychotherapy of medical students than we had believed would be necessary. Thus we have a considerable body of knowledge based upon psychotherapy with these people.

First, let me say that of over 500 freshman medical students seen, only two refused to be interviewed by us. Interviews were not compulsory. They were announced, and we told students that the proceedings were to be confidential, that none of the information would be on any official record—students found that we kept our word on this and our knowledge about these students was not even known to the administrators of the school. In addition to the two students who refused to be interviewed, one refused to have a Rorschach test.

The interviews were conducted in as little of the inquisitorial manner as possible. They were along the lines of an initial interview of a psychiatric patient except, of course, there was no initial complaint. We merely gave a statement that we were interested in why and how they got here in medical school, what problems had arisen along the way, what was being faced now or anticipated in the future. We also asked students about their family and about their early life training. We were interested in their conscious feelings about their motivation for occupational choice, and we tried to interpret from our data some of the unconscious motivations. This involved the use of a projective device; we were trying to have them project into the role of a physician while they were still medical students. We tried to avoid a pedantic fact-gathering type of interview.

Some interviews spontaneously developed along the line of request for therapy. In all cases where it was obvious that there was extreme defensiveness against the expression of personal feelings, we let this go just as the student wished to express it. Sometimes, we gave up an interview after a fairly sterile half-hour. These people, although they came for an interview, did not really wish to reveal anything or else couldn't reveal anything. We didn't push them. Other times we talked for two hours and saw students for several interviews. Usually interviews like this ended up in some type of psychotherapeutic result—too much anxiety had been revealed, and we had to spend time getting it resolved to some extent again.

What kind of people did we see? I am afraid I can't give you anything very statistical on this. Our impression was that the majority of the students we saw were quite conformist, emotionally constricted men and women, given to internalizing their hostility either with depressive or compulsive traits for the most part, or sometimes with somatic manifestations. We felt that there was a high premium put on this in premedical competition and, provided that it was not too extreme, we thought of this matter of conformity and constriction as actually one of the criteria of success both in premedical work and in getting through medical school.

I may say that we feel that this pattern was confirmed by the psychological tests we gave, particularly the Rorschach—a personal Rorschach was given to each of the students. In about 10 per cent of the students, this constriction was quite severe, and I think it is noteworthy that hardly any of these students finished in the upper quarter of the medical school class, even when a number of these had done extremely well in their premedical grades.

Members of this latter group were likely to give as a major choice for their career in medicine, "I was always interested in science." When an attempt was made to discover what "science" meant to them, it turned out that it meant collecting facts or performing various kinds of what I would like to term magical tricks with test tubes. These students did not ever give a definition of science in terms of a method of formulating, validating, and projecting problems for investigation. Their science was a cookbook kind of technicianship.

Another group of this emotionally constricted population didn't look emotionally constricted on the surface. They were the kind of people that David Riesman, the sociologist, has called the "other-directed personality" or sometimes he uses the phrase "radar-directed," a person who picks up his cues from the environment very readily and conforms without the inner (or "gyroscopic," as Riesman calls it) conformity that the true compulsive person has. These students, I may say, usually look cleaner and neater on the surface, and they aren't really compulsive people. I sometimes think of them as the "all-American boy with a touch of the Babbitt."

Now, the more students tended to be like this group, the more they tended to give as their interest in medicine that they were "interested in people." This is another one of these pitfalls that Dr. Joseph Zubin has mentioned. You have to find out what is meant by this term. We usually found that these people had lots of friends but hardly any close friends, if any. They said not that they liked to talk with people, but that people liked to talk with them. They were frequently quite adept at manipulating other people as objects, not really caring too much for them, and of course I think that is one of the reasons why they had difficulty in having close friends.

Sometimes this manipulative drive is hidden under the statement that the prime motivation is "service to humanity." This, of course, is what interviewers are usually very happy to consider as a favorable criterion for selection. It is difficult to detect that the "service" is sometimes really more akin to the often-heard phrase that parents use, "I am doing this for your own good"—the so-called "benevolent despot." It is difficult to detect this because not only do interviewers like to believe this statement, but they are especially prone to believe it when the applicant sincerely believes he is benevolent. This is not conscious fraud on the part of these people. I have been fooled many times, but I think that most of you would realize that the man's contemporaries are hardly ever fooled.

Concerning motivation on the level of gratification of instinctual drives, with various degrees of sublimation of the drives, I should emphasize here that it isn't the drive which is bizarre. We all have these basic urges; it is what we are doing with them, how we control them. For example, one man said he had been interested in being a doctor for many years. In going back to when this first came up, it turned out that when he had his tonsils out as a boy, the ice cream was just a wonderful thing—and incidentally this man was quite overweight. Well, a shrewd guess on our part, which we can't actually confirm statistically, is that he had been compensating for his

fear of the mutilation that was involved in his tonsillectomy by identifying with the aggressor, and that he expects oral or material profit as a condition for his feeling benevolent towards children or his inferiors; perhaps he is not fundamentally sadistic. This is common as a pattern and probably should not be called pathological.

When a man says he wants to be a surgeon because they get to the root of the problem quickly and do something definite, that is one thing. But, for example, consider a man who wants to be a surgeon who says, "I am interested in being a scientific type of surgeon," and then tells you he is very impressed that the Nazis did wrong things in their scientific experimentation. Well, again, so far it sounds good, but when you find out that the "wrong thing" was that their scientific experimentation was unscientific because they didn't use proper controls, one begins to wonder about what this man is really feeling. He missed completely the unhumaneness of it. I spent some time with him trying to dig this out and was completely unsuccessful. One wonders if his sadism is in sufficient control for him to become a good surgeon.

One man like the one described above had an almost perfect premedical average but did poorly in medical school; he got a surgical residency and was discharged from it, got another one and was discharged from it too. Another man said that he realizes a doctor has free access to the secrets of people, physical and emotional; he openly said that his awareness of this stems from an ungratified sexual curiosity he had as a child. This sounds very pathological—this man was sick—but he did very well in medical school. Also, at his request, he had three years of psychotherapy during that time and is doing well now. Incidentally, he was also endowed with an extremely good intellect and a great deal of raw, physical-drive energy.

What about overtly psychotic individuals? We have seen a few. We saw one who had a schizophrenic break before he started school. He told us about it and there was no doubt it had been a schizophrenic break, but he made Alpha Omega Alpha and is now doing very well.

Most of the disturbed individuals graduated without many people suspecting their difficulty. As far as psychoses are concerned though, severe depression was a distinct handicap for several people. A number of such students failed to get through, and sometimes they were not failing scholastically. For example, there was one man who had a depression in his senior year which was unnoticed by the entire faculty, including our people on psychiatry. He took his final comprehensive examination, passed it, and was going to be graduated when he came to us and said, "I am a fraud. I can't go through because I really haven't been working this past year. I want to repeat the entire year." He did.

A further thing that I am excluding when I talk about severe pathology is pathology as picked up only on a Rorschach test. When we first started doing these tests, we were unduly impressed by the pathology that we saw. It was only after some time that we started looking for the positive things rather than the negative things.

Now, concerning the interviews, how can one detect the scientific tech-

nicians or the phony saviors of mankind who want to collect us as specimens rather than to save anybody from anything? How can one tell genuine humaneness and genuine scientific spirit of inquiry? How can one determine that a man is not stupid but a solid, reliable, plodding, workhorse? How can one tell if a man who wants to be a pediatrician really wants to take care of children or is merely suffering from a great deal of poorly integrated anger toward the children who came after him in his family?

There is no sure way to answer these questions in a single interview. We all really pick people and prefer them in our own image, and maybe that is a good way to get some diversity at least into our medical schools. There is probably room in each class for a gamble on a few who don't appear with the best academic record, who can't talk very well during an interview. One man told me that when he was in the Air Force as a combat pilot, he saw enough killing: "I felt I wanted to do something constructive with my life. I had the chance to see some orthopedic surgery when I was in the Army and that impressed me as something that was really helpful to people." This man was from a lower-class social background and had below-average grades premedically (except when he returned from combat, when he made straight A's), but he did extremely well in medical school and is doing well now.

In spite of attempts to be tolerant toward various personality patterns which might be serviceable to a man either in general practice or specialties, what I probably do—as do many others—is to judge whether I would like a man to be my surgeon, my pediatrician, or my general practitioner. For this reason I feel that it is not wise to have any special group, especially psychiatrists, do all the picking or to have a major influence on the picking of medical students.

Now, I feel that the function of the interviewer, and I would strongly subscribe to what Dr. Zubin said, is to assess the human qualities, not to try to assess the intelligence or some other factors like that, and not to try to pick people for definite things. The people who say they are interested in research often turn out to be good clinicians and vice versa. One of the things to consider is the growth potential of the individual. This is not easy to quantify. What I mean is, has the man reached the peak of his performance and is he now working desperately to keep at this level? Has he more reserve to cope with the intellectually more rigorous, demanding aspects of medical school life as compared with premedical school? Is the man a sleeper, a late-bloomer, to use Alan Gregg's term, a diamond in the rough who is getting his start later? Here, again, we have had some sad experiences with people who have puttered along, got advanced degrees, and are degree-collectors, as distinguished from one or two of our older students who were still on their way and made good later.

I would like to say one word, too, about the women whom we saw, because I feel this is a subject that frequently is neglected. In looking over the responses of the freshmen to the pre-Institute questionnaire, I noted one woman's comment which indicated she felt the interviewer was extremely biased against women going into medicine (Table 4.12, Chapter 4).

Most women are quite sensitive to the fact that they are being discriminated against, and most of them are quite sensitive to the fact that it is very hard to combine motherhood and a career in medicine. I have seen quite feminine women in medical school who have hidden their femininity; some have denied it to themselves because they felt that it was just not right.

We should pause and reflect whether we should pay more attention to encouraging the acceptance in medical school of less rigid people who can perhaps enrich the future crop. That seemingly gregarious, nice guy, personality kid may be a phony who is a ruthless manipulator of people. Further, we probably can afford to have room for a few odd-appearing, perhaps eccentric, original people on whom we can gamble as real additions to our ranks of future researchers or even to better types of practitioners. I don't think that these qualities of flexibility, socially useful conscience, and originality can be taught in premedical school courses, nor can they be taught in medical schools. It depends upon the soil that has been fertilized by early childhood experiences, by parents who have not stifled the creativity and emotional warmth of their children.

C. The Interview as a Selection Tool for Industry

BY FRANCIS W. HIBLER
Rohrer, Hibler & Replogle

MY ASSIGNMENT on this panel is very specific. I have been asked to report to you how our organization uses the interview as a tool of selection for key positions in industry. It has been further suggested that I confine myself mostly to the "how" instead of to the theoretical "why." By way of introduction, I shall make a few general remarks about our use of the interview with other tools for top-management selection. We evaluate only people who are being considered to fill top positions and do no selection work at the hourly wage level or for less complex managerial positions.

In our organization no evaluative interview is attempted without the help of psychometric data. These data not only serve as a check on our clinical judgments, but often form a springboard that gives a sense of direction for further investigation by means of the interview. We regard the interview as a plus rather than as a substitute for psychometric data. All interviewing from beginning to end is done by a Ph.D. in psychology who, in most cases, joined our staff after postdoctoral experience on a university faculty or as a clinical psychologist for the Veterans Administration.

Any interview tends to be effective only to the extent that the interviewer knows what he is seeking. Since 1927 some members of our organization have been trying to find some answers to this stubborn problem of what patterns are characteristic of successful executives in general. There are some answers that have emerged, but there is a great deal about this problem that we still do not know, and our group is studying it continually. For the most part we have not been able to quantify these patterns, but be-

lieve they can be recognized in part at least when we see them.

In addition to the general pattern, another problem is that of determining the unique characteristics required for success in the specific job, in the specific client company under present specific conditions. All too often we have found a man who may have all the qualifications to be a vice-president of one large company, but who would fail in another that is in exactly the same type of business. As a result, we are convinced that we must study very carefully the way of life of the company for which the man is being evaluated, as well as the man himself. In other words, we believe that both the general pattern required for success in business and the dynamics of the specific company where the candidate is to work must be studied before any individual evaluation is begun. The individual firm is examined by evaluating the top executives who establish its way of life—first the chief executive officer and then his immediate subordinates. All of this is preliminary to the evaluative interview of any candidate.

Let us now turn to the interview itself as a tool of selection. Usually interviews with candidates are about two hours in length, although they vary as the interviewer's judgment dictates. Very seldom are they less than that. In addition to the conventional psychometric aids such as an intelligence test, personality inventory blank, and whatever else the individual clinician may decide to use, we follow a personal history blank that we have devised. In general, the evaluation covers the applicant's history, his education, his own report as to his health, his recreation and hobbies, his social activities, his family history, his childhood environment, and other data that may emerge as important. The interview is not rigidly structured, but we do cover all of these areas. In doing this, we have a definite objective in mind—to get sufficient data to enable us to make clinical judgments in each of five personality areas that we believe to be significant in determining the candidate's success:

1. His intellectual effectiveness, not necessarily his intelligence
2. His maturity and stability
3. His skill in human relations, the pattern he follows in living with people
4. His insight, both into himself and others
5. His ability to organize and direct both his own activities and those of others

Now I am going to enlarge briefly on each of these, and I emphasize the word "briefly" because weeks are spent in studying these things. The following merely indicates the type of thing considered and is not inclusive.

Appraising intellectual effectiveness

The first area explored is that of intellectual effectiveness. Here, of course, we are interested in a man's native ability, and at this point psychometric aids are extremely important. They are used to seek an answer to the question, "Does this man have enough intelligence?" rather than to attempt to determine its extent by the use of a power test. In industry, as in many other areas of life, the fact that a man rises on merit to the position of top

leadership seems to have little relationship to his score on an intelligence test, providing that he is in the above-average group.

Beyond native ability, we are even more interested in the person's method of thinking. Is he able to identify deftly and precisely the central problem of an issue, or does he find himself confused by a mass of data? How does he organize his thinking when attacking a problem? Does he tend to go off on tangents? Does he follow a logical sequence? Or, is he an intuitive thinker who is brilliant at one moment, but one who is likely to miss the boat the next? Does he use his past experiences soundly? Some individuals go to the extreme of overgeneralizing when facing a new problem that has some common element with a former situation and assume the two are identical. Others seem to be incapable of organizing their experiences so that they can draw upon them at a future time, and for such a person each new problem is unrelated to his past experience.

What about a man's emotional blocking or prejudices? To what extent is his thinking dominated by logic-tight compartments? To what degree does he have an ability to recognize his prejudices and what techniques does he employ to control them?

Another important factor investigated is what we call the comprehensive factor of judgment. In our industrial picture today, there are many people who have the ability to handle a single problem at a time, very much like a man who is throwing a ball higher and higher in the air and developing increasing skill in catching it. But he can handle only one ball at a time. Such a man has his place in industry, but it is not at the top level. There an ability is required which is more analogous to that of a juggler who must keep several balls in the air simultaneously. The top executive must be able to catch the problem quickly, then let it go quickly, in the right direction with the right force, and catch the next problem before it falls around his feet. Such an ability is more rare than is frequently supposed, but invaluable in a top executive. This has very little correlation with the score on the intelligence test, incidentally. Without this skill he cannot delegate successfully, and if he cannot delegate, his ceiling is limited. High intelligence only gives him the opportunity to develop this ability—it does not insure that he has it.

We are also interested in checking how he handles abstract problems versus concrete situations. Obviously this consideration is important in determining how far he can go in business life. These are some of the many areas studied by means of the interview under this category of intellectual effectiveness.

Appraising maturity and stability

The second category is that of maturity and stability. The clinical psychologists on our staff make a routine check as to whether or not there are any major mental difficulties in the picture. If so, he is referred for psychiatric help. Under this category of maturity and stability we attempt to gain an understanding of his philosophy and core values of life. What is he after and how does he attempt to get it? To what extent are his verbal-

izations, his history, and his projections consistent? Almost all he says or has done from early childhood yields significant data here, if we are skillful enough to draw him out and interpret what we see and hear. The accurate determination of the core values of an individual presents one of the greatest challenges to any evaluator. If we miss here, our evaluation has doubtful value.

What about his basic security as a person? To what extent does he have it? Where does he seek it? From what sources does it stem? Is it from job title, financial security, a family name, marked social skills, a high evaluation of his own intelligence? Or is it from a sense of being a growing, productive person making a contribution to society? We all recognize that many achieve success in the industrial picture when their drive is grounded in their personality maladjustments. We have found, however, that as we are going to live and work with them in the future and help them grow, it is very important that we try to get a clear initial picture as to their motivational patterns.

We also make some judgments as to how well the individual can stand up under pressure. Can he remain organized and keep his freedom of action under trying circumstances? At what cost to his mental and physical health does he maintain his external composure? Again, does he seek immediate satisfaction at the expense of long-time growth and development? What about his control of anger? Is he subject to marked swings of mood and energy output? These are some of the questions we attempt to investigate in the second category.

Appraising skill in human relations

Now the third area—skill in human relations. Everybody has some skill in human relations if he is a normal person. We seek to determine with whom, under what circumstances, and with what degree of flexibility. In the industrial hierarchy there are at least three groups to whom one must adjust: his superiors, his subordinates, and those on an equal level. A person may be most skillful in dealing with one of these groups and yet lack skill in working with one or both of the others. How readily and how quickly can he adjust to new social situations? Is he the type who will wear well? Is he consistent in his skill in human relations, or does he turn on the charm only when he is interested? What about his basic sense of humor, which includes the ability to laugh at himself? Is he skillful with just certain types of persons who approximate his own interests, or does he have a high degree of flexibility? Does he sit in judgment of others, or does he have a genuine outgoingness? Does he use techniques to manipulate others to achieve selfish interests? Is he genuine and straightforward in his relations with others? These are typical questions we explore under this third area of skill in human relations.

Appraising insight

The fourth area is insight. The degree of insight a person possesses is most difficult to evaluate. Furthermore, it has been our experience that it

is one of the most difficult areas in which to stimulate growth. Many times I feel insight is a keystone in making the prognosis as to whether a man can be helped to grow and develop.

We attempt to discover how well he understands himself, as well as the extent to which he understands the motivations behind the behavior of others. Many individuals have a fairly accurate, superficial understanding of their own strengths and weaknesses at the verbal level, but digging into their pattern as shown by their history may reveal whether or not they are skillful in doing anything toward self-improvement. Even if one can catalog his own strengths and weaknesses with some accuracy, he may reveal a history of doing little to improve his weak points, and the insight of such a person is superficial. Some people are introspective to the point of morbidity and accomplish nothing in their self-improvement. Others take the attitude of Popeye: "I yam what I yam, and that's all that I yam." Still others not only understand their balance of strengths and weaknesses, but plan intelligently and move consistently toward doing something about it by growth, environment control, or supplementation by others to support them.

Beyond himself, does a person recognize individual differences? Does he habitually attempt to study the motives behind the acts of others? Does he have blind spots with certain types of individuals? Does he project his own motivation as the key to understanding all others? Does he attempt to put each person he works with into a class or type and then overgeneralize as to their dynamics of behavior? Or does he just give up and remain insensitive to the entire problem of the motivation of others? Or is he capable of that degree of understanding that will enable him to be a strong teacher and leader of his subordinates, as well as being a strong contributor to the team effort?

Appraising ability to organize and direct

The last area, that of a person's ability to organize and direct both his own activities and those of others, is fairly obvious. Industry, of course, is interested in determining a man's degree of skill in delegation. As psychologists, our staff attempts to dig into the dynamics of his personality to see if there are major blocks that will prevent him from further developing skill in delegation.

Several questions are asked in appraising this area of ability. How well does a person plan for an even flow of work and activity, both for himself and others? Is he consistent in organizing and directing the work of others? Does he drive hard and then loaf? How does he give and take criticism? What is his concept of how people should live and work together? Is his philosophy basically that of "power over" or "power with"? Does he play favorites while consigning others to his own doghouse? Is he consistent even in this? Again I have listed only a few of the relevant items in this area.

Appraising the individual as a whole

So much for the five areas. What then? All of this merely leads to the

major problem of looking at the individual as a whole, before placing him against the demands of the job situation as a whole and making a final judgment. As we have discussed the five areas, I am sure that many of you have been thinking about the inevitable overlapping and interrelations among them. Surely, for example, an individual's maturity is related to his ability to delegate; his skill in human relations is related to his insights; and his core values are related to his behavior in team play. This is as it should be when we are studying an individual.

Is not this the modus operandi of all evaluative procedures? May I take your profession as an example? How does my physician proceed when giving me my annual physical evaluation? He has certain areas or categories in which he makes judgments such as my circulatory system, my digestive system, my respiratory system, my nervous system, and so on. He, or his technicians, give laboratory tests, some of which yield a quantitative score and some do not. Then we sit and talk—he interviews me. Some of his questions are direct, some are unstructured, but *he* knows what categories he is studying and the interrelations of these categories. Incidentally, to the best of my knowledge, these categories have not changed a great deal in my lifetime, but such questions as how to study them, what is normative in each, what should be included in each, and what are their interrelations have changed rapidly and tremendously.

Somehow I get the impression that my physician feels his clinical judgment, based on all his training and experience plus the test data, is what he really has to offer me. That I buy. I also recognize that other of his colleagues may come up with different judgments based on the same data, especially if my condition is in the gray zone rather than the black and white of the clearly deviate.

So it is that we approach the interview as a tool of selection, or evaluation, or diagnosis, whatever one may choose to call it. The physician or surgeon decides to operate or not. We decide to hire or not. You decide to admit to medical school or not. Some decisions are easy for all of us; some are difficult for all. In general, however, the medical profession with its years of research and history far outstrips us in knowing its categories, what is important in them, and how to measure their factors and interrelationships more precisely. It has had far more experience in making clinical judgments and in having life or death act as the inexorable validator. Psychological evaluation is young in general, and it is almost embryonic as a tool to aid in the selection of people for key positions in industry, but I believe we are making some progress and I sincerely hope we are pointed in the right direction in our emerging profession.

D. A Critique of the Interview

BY E. LOWELL KELLY
Professor of Psychology, University of Michigan

MY INVITATION TO SERVE as a member of this panel is due primarily, I guess, to my work in the general field of assessment, including the interview as one technique of selection; it is also possible that I was invited because I have a reputation for being something less than enthusiastic about the utility of the selection interview.

My own work with the interview as a selection technique extends back to a study of its value in the selection of pilots in the civilian pilot training program just before World War II and to its use in the selection of pilots in the Navy Air Arm. After the war, I was concerned with evaluating the interview in the selection of candidates for training in the doctoral program in clinical psychology in the Veterans Administration. During the last few years, I have had some contact with the interview's use in the selection of medical school candidates.

In all of these instances we have tried to create an experimental situation in which we could ascertain, "Does the interview work as well as it seems to?" Everybody thinks it works, but does it? In each of these instances where we have put the interview to a test and collected data in a fashion whereby we could determine whether it added anything to the accuracy of the prediction of performance without benefit of the interview, we have had to come up with the conclusion that it was not worth the cost. All evidence suggests that it gives a great deal of satisfaction to the persons who use it; they usually feel good about it, but we have not been able to demonstrate in any of these investigations the utility of the interview. And, in view of its cost in terms of professional time, our findings raise serious doubt whether it can be defended as an economical procedure.

Research on the validity of the interview

Our findings are not surprising in view of the entire story of the published findings with respect to the validity of the selection interview. In reviewing some of this research, I am going to quote quite extensively from a paper I prepared for an audience a couple of years ago under the title of "An Evaluation of the Interview as a Selective Technique," originally presented to a conference on testing problems arranged by the Educational Testing Service.[1]

Now, what is this evidence about the interview? Here I am going to hit only the highlights. A number of years ago Scott and Hollingworth,[2] in independent pioneer investigations, reported surprisingly low interjudge agreements between interviewers regarding sales ability of prospective sales-

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[1] *Proceedings of the 1953 Invitational Conference on Testing Problems.* Princeton, New Jersey: Educational Testing Service, 1953.

[2] Scott, W. D. "Selection of Employees by Means of Quantitative Determinations," *Annals of Amer. Academy of Polit. and Soc. Sci.* 65, 1916.

Hollingworth, H. L. *Vocational Psychology and Character Analysis.* New York: Appleton, 1929.

men. Since that time many comparable studies have been conducted and practically all of the research findings point to similarly-low interjudge agreement and, where criteria are available, to very low validities. Some of the more recent findings are those growing out of our own project at the University of Michigan. I will review them very briefly.

In our work on the selection of clinical psychologists, we used two interviews. The first was an hour long, conducted by a staff member who had previously made judgment of the candidate on the basis of the credential file, which contains letters exchanged between the University and the student, references, and so on. The second interview was a two-hour one conducted by a different staff member with the same candidate. The second interviewer had previously made an intensive study of the credential file, studied all the scores on the objective and projective tests, read the candidate's autobiography, looked at the biographical inventory, and tried to integrate all of this information. These interviews were carried out by trained, professional persons who were permitted to structure the interviews in the manner they believed most useful for the task at hand. The validity of interviewer judgments made before and corrected after the interview was estimated against a dozen different criteria obtained four years later.

The results were such as to force us to conclude that neither the short interview, made with relatively little information, or the long one, made with lots of previous information, contributed to our assessment program. Actually, the increase in validity was just infinitesimal. At least the validity of these interviews was not negative as was true in a recent study reported by Thayer,[3] who attempted to predict the subsequent field success of missionaries to whom a body of psychological tests had been administered some 20 years earlier. In this study an admittedly fallible criterion, i.e., success as a missionary, was predicted by a correlation of .53 with the psychological test battery, but the ratings made by the secretary of a missionary selection board on the basis of an interview, references, and other papers actually showed a negative correlation with later success in the field.

Perhaps the most cogent evidence for doubting the validity of a conventional selection interview appeared in a recent article by Holt and Luborsky[4] which reports on a research project on the selection of psychiatrists. In contrast with our own Michigan assessment program, this Menninger Project relied most heavily on judgment based on the selection interview and a battery of individually administered psychological tests. Each applicant was independently interviewed by three psychiatrists, each of whom made a prediction regarding the candidate's probable success in psychiatric training at the Menninger School of Psychiatry.

I would like to call your attention to the fact that in many ways this was an almost ideal situation for testing the validity of an interview. First,

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[3]Thayer, C. R. "The Relationship of Certain Psychological Test Scores to Subsequent Ratings of Missionary Field Success," *Univ. Pittsburgh Bull.*, 1952, p. 48.

[4]Holt, R. R. and Luborsky, L. "Research in the Selection of Psychiatrists: a Second Interim Report," *Bull. Menninger Clinic* 16, 1952, pp. 125-35.

it should be noted that the interviews were conducted by staff psychiatrists presumably expert in the art of interviewing. Secondly, and this is very important, the predictions made were with respect to performance in a local situation—their own training program, the program with which the interviewers were thoroughly familiar. Finally, although Holt and Luborsky don't provide evidence on the point, many of these interviewers were actually a part of the team that evaluated the success of these individuals two or three years later in the program. This would have resulted in raising the correlations if there had been some overlap.

In spite of these seemingly optimal conditions, the validity of these interviewer judgments are shockingly low, the median being .06 for 14 interviewers. Only one of these 14 presumably expert interviewers had a validity large enough to achieve statistical significance at the 1 per cent level.

I might also mention that at one point in our work on selecting pilots we had three interviewers working on interviewing prospective pilots. Our eventual evaluation of them as interviewers showed just about as many of them with negative validities as with plus validities. The average validity was right around zero. We didn't have a single interviewer who in this study did better than chance. We had hoped that maybe we would find some who had significantly high positive correlation, and then we could figure out ways of selecting selection interviewers, perhaps by having other interviewers select them!

Evidence of this kind does not prove that the interview is valueless as a technique of personnel selection. There may be some situations in which some interviewers are able to use the technique and arrive at judgments with high predictive validity. If so, it seems most unfortunate that they have not been reported in the literature. On the contrary, all evidence available suggests that the technique is apt to have sufficiently low validity, even under optimal conditions, to make doubtful its general utility as a selection device.

Now, this leads to what I have called a very interesting paradox. We are forced to conclude that the most widely and confidently used technique of personnel selection is one for which there is surprisingly little evidence of validity. This curious situation appears to have its parallel in the clinical field in the current popularity of projective techniques, largely unvalidated for predictive purposes. There is also an analogy in the field of education where widespread use of essay examinations continues, although they have in many studies been shown to have very serious deficiencies.

I am very curious about what it is that these techniques have in common. In all three instances, the choice of technique is obviously based on factors other than evidence of validity. Now, I don't pretend to know what these factors are, but I have a hunch as to what is going on. Note that in each of these three instances, the technique is chosen and used by professional persons confronted with the necessity of making decisions about people—decisions which are significant in the organization of which they are a part or to the persons about which they are made. One cannot take lightly such responsibilities as deciding whether it is A or B that is hired for a

particular job, C or D that goes to a mental hospital, E or F that gets into medical school. Ideally such decisions should be made on the basis of tested techniques with high predictive validity.

Unfortunately, as we know, such techniques don't exist. The best of our tools lead to but fallible predictions of later criterion behavior in all of these domains. They enable us to guess right much more often than wrong, but they are still subject to many errors of prediction.

In the case of psychometric tests, we go about calculating the correlation, and so we have a reasonably precise estimate of our accuracy and of the magnitude of our errors. In the impersonal situation of a selection program based on psychometric procedures, we seem to be able to tolerate the truth of our fallibility, knowing at least that we are not making as many errors as we would make if we didn't use these things. Now, in many situations, many persons do not appear to be able to accept the inevitability of errors in decisions and in predictions, especially about important decisions. Such persons go about idealistically searching for an instrument with more sensitivity to human behavior and personality. Noting evidences of such sensitivity in the writings of poets, dramatists, and philosophers, they conclude that the best instrument for the task is another human being, perhaps themselves. They then proceed to try out some newly developed instrument, or an old one that they have heard of someone else using; they interview a few people and interpret their handwriting or read their essays or read their *Draw-a-Picture Test* or something else—and lo and behold, the instrument seemed to work and work well.

Since the instrument, that is the human being, and the technique worked so well why shouldn't it be used for some practical purpose such as in a selection situation? And so the interviewer and projectionist and the proponent of the essay test go to work. In each case the technique is apt to be employed by a person already pretty well convinced of the validity or the correctness of the decisions that he is making. Under the circumstances it is not surprising that the user of the technique rarely finds occasion to submit himself and the technique to a true validity check. Instead, as a result of each decision made, a decision which just doesn't dare be wrong, he becomes more and more convinced of the validity of the technique and of himself. If someone else insists on investigating the validity of the technique he can find all sorts of good reasons why the results of the study aren't to be taken seriously. The most common is that the criterion isn't any good, or "I am not surprised that you didn't find that bunch of interviewers so good; they aren't very well trained." But the implication is always, "If I hadn't been too busy, if you would have checked on me you would have found that my validity is good."

Once having committed oneself to the position that a human being is the most essential part of the assessment process, it follows that the choice of specific techniques to be used is likely to be one that enhances the role of the human being who uses it. What are the conditions that lead to an enhancement of the feeling of the importance of the user on the part of the user? It should be one that provides for maximum flexi-

bility, that is, he can adapt it to every situation. There should be nothing cut and dried about it. He can be the judge as to how the interview should go. It should be one that requires the extensive use of good judgment, his good judgment. Furthermore, it should be one that provides a maximum of information to be integrated by the human mind. The more information you get the better judgment you make. This is just horse sense, isn't it? Anybody knows that to be true. The interview, especially the unstructured interview, rates high in each of these respects, and hence I suggest that it serves admirably to reduce the threat of anxiety which otherwise would be present in persons who accept the responsibility for making judgments about decisions important in the lives of other people. I really think that when we place in the hands of a person the responsibility for making judgments like this, we have to give him the right to use whatever technique of anxiety-reduction that he finds convenient. Whether it has any validity or not, as long as we insist on his making judgments for which we don't have any better means of making good judgments, then we ought to let him believe in anything he wants and people can get the wildest ideas as to what they should believe in.

In the early part of the war, when I was associated with the Naval Aviation Selection Program, the responsibility for selecting aviation cadets was held by cadet selection boards made up for the most part of reserve officers. Many of these knew little or nothing about airplanes or pilot training. They were reservists, former teachers, lawyers, and so on who had to be given some job appropriate to their level of education and so they were assigned to act as interviewers on cadet selection boards. As we visited these boards early in the war, these people would plead, "Please, you are from headquarters, tell us how you recognize a good potential pilot." We said we didn't know but were doing research on the problem at the time. It was very interesting to come around to a board six months later, after these people had been forced day after day to make decisions accepting A and rejecting B. Remember they had had no feedback whatever as to whether the people they had selected had turned out well, failed, or killed themselves in flight training, but the fact that the board members had been forced to make these judgments on a day-to-day basis had induced each of them to develop a little theory about what it was that made a good pilot. As long as a fellow could find a theory that satisfied him—one that enabled him to make the decision without worrying about it, he not only found it comfortable and easy to perform this task, which before he had found threatening, but he went around trying to convince other people of the correctness of his theory!

For example, I remember one chap who said, "I have found one question that enables me to pick out the good aviator candidate." "That is interesting," I replied, "we find that we need several hundred in our research on this problem, but what is your question?" "Well," he said, "we just ask him 'Did you ever collect stamps?' Obviously if he did he is an introvert and an introvert doesn't make a good pilot and so we just turn him down." Another chap, just as confidently, told me that he had found one

question but it was a different one: "Have you ever had intercourse?" According to him, any young man who had not had intercourse obviously didn't have enough courage to become a military pilot.

There are personnel interviewers in industry who are sure that red-haired people are just troublemakers and so they never hire a red-haired person. Of course, none of you has such simple theories for selecting medical students.

Since you seem to like stories, I will tell you a true one. It isn't funny, it is tragic. This is a true story that occurred also in connection with a pilot selection program, that of one of our allies. In brief, one of my psychologist colleagues attached as a civilian to the air force of that country had the job of continually monitoring the effectiveness of the cadet selection program. Unlike the situation here, the need for student pilots was so great that no matter how a selection board evaluated an applicant, he was usually sent on to flight training anyhow. The usually high medical standards had been greatly relaxed, and most applicants were given a chance at flight training if that was what they said they wanted to do.

All candidates had in the meantime been rated by a board. My friend's job, among other things, was to check from time to time to see if any of these cadet selection boards were making better than chance predictions regarding the outcomes of pilot training. As you might expect from the other research findings which I have quoted, most of these correlations were hovering around zero. However, in the course of the war, he found one cadet selection board which for two successive check periods showed a correlation significant at the 5 per cent level. Now this could have happened by chance, but my friend felt it was so unusual that the situation deserved closer examination. So he arranged to visit this board. The commanding officer was a veteran pilot of many aerial encounters but also a taciturn, noncommunicative individual. Although welcomed to observe the operations of the board, my friend at the end of a week was still without any clues as to how the work of this board differed from that of any other.

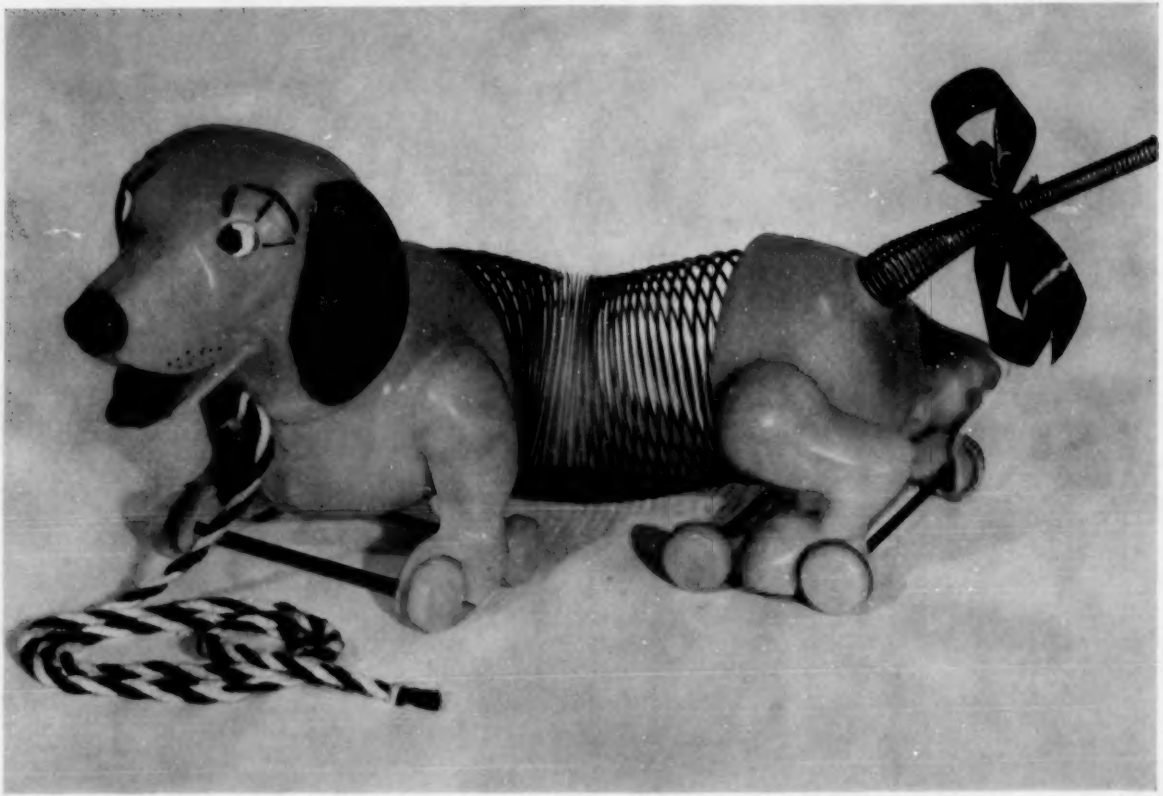
About this time the commanding officer surprised my friend by asking: "Have you found what you came up here for? I know you are up here trying to find out how we select pilots." My friend admitted that this had been the purpose of the visit but that he hadn't the slightest idea how they went about selecting pilots, even after watching them for a week. At this point, the commanding officer relaxed and invited my friend to the officers' quarters for a drink. In the course of their conversation, the commanding officer confided as follows: "I wouldn't let an ordinary person in on this, but since you are a good fellow, I will tell you how we select pilots up here. You have noticed my dog, haven't you?" (My friend had observed the dog who followed the officer around all the time and was present for all interviews.) "A long time ago I decided this dog knew a whole lot more about selecting pilots than I did. Any time that the dog makes up to a candidate, we give the fellow an 'up' and any time he doesn't we give him a 'down', and that my friend is the way we select pilots here!"

Implications of the research results

What I have tried to do is look at the selection interview and ask why it is that the validity research turns out as it does. Information, whether obtained in an interview, from an autobiography, or from a transcript, is useful only if one knows its relevance to the criterion or criteria one is attempting to predict. If such knowledge is not available, there is a real risk that the information will be used in a manner that will reduce the accuracy of the predictions that are made. As an example—and an illustration of how one can make inferences about the implicit "theory" or hypothesis used by interviewers or members of an admissions committee —let me refer briefly to certain of the findings from a current study reported more fully in Chapter 10, Section C. In the study we are doing at the University of Michigan we find the best single predictor of general medical achievement (as measured by over-all grades and *National Board Examination* scores) to be premedical college grades. We also find, curiously enough, that the number of premedical credit hours in inorganic chemistry and in biology submitted by the applicant is negatively correlated with medical school grades. This is not surprising, I think. The weak student, who feels himself weak, or whose advisor feels the student is weak, is very apt to take additional courses in chemistry or biology. Medical educators may not like it, but at least some misguided advisers recommend this. At any rate, we find a significantly negative correlation between the number of hours in such courses and our criterion of medical achievement.

It so happens that in this study we also have the ratings assigned each applicant by the five members of the admissions committee; thus, we are able to relate the ratings of these judges not only to the criterion but also to all of the other predictor variables. Although this involves a great deal of computation we are fortunate in having available an electronic computer. All we have to do is digest the results afterwards! We were particularly interested to discover that one of the five judges doesn't allow his judgment to be influenced at all by the amount of chemistry or biology on an applicant's record. His ratings, although not as predictive as premedical grades alone, are the best of the ratings for the several members of the admissions committee. The other four members of the medical admissions committee, it turns out, all make the mistake of allowing themselves to be favorably influenced by the number of hours of chemistry or biology in the transcript; they rate such people as better risks, which in turn reduces the validity of their prediction.

In closing I am going to stick my neck out and predict with a very high level of confidence that the selection interview will continue to be a widely used and highly respected technique. No amount of evidence, negative evidence, regarding its validity seems likely to change the situation. I predict that the popularity of the interview will decrease only when and to the degree that more valid techniques and devices are developed to do the practical jobs of selection in our complex society. These must be done by somebody and in some way.



MR. KELLY DIOGENES IN SEARCH OF A MEDICAL STUDENT

On the morning following Dr. E. Lowell Kelly's paper, "A Critique of the Interview" (see p. 83), Dr. Carlyle F. Jacobsen had the honor of introducing this unexpected but distinguished visitor to the Institute participants. Mr. Diogenes, leading authority in personnel selection, has kindly consented to pose for this photograph.

CHAPTER 6 A Symposium

Appraising Nonintellectual Characteristics by Formal Psychological Techniques

As POINTED OUT IN Chapter 4, the whole problem of finding better ways to assess the nonintellectual characteristics of medical school applicants is one of some concern. Thus the Institute Planning Committee agreed to devote two topics to appraisal techniques in this area—the informal techniques (notably the interview) and the more formal psychological techniques. This chapter reproduces the symposium on formal psychological techniques. Topic chairman Woodrow W. Morris has prepared the introductory section which summarizes the historical development of tests and measurements and lays the groundwork for the three papers that follow.

A. A Brief Survey of the Use of Formal Psychological Tools

BY WOODROW W. MORRIS
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MANY OF THE INSTITUTE participants indicated through their questionnaire responses that they have a very real interest in the techniques that psychology could bring to bear on the evaluation of personal and social characteristics. At the same time they indicated a lack of basic knowledge and information concerning psychological tests and methods and the contributions these might make in medical school selection.

Our orientation in planning the symposium reproduced on the following pages was toward review and clarification of the problems involved in the use of psychological measurement techniques in the assessment of nonintellectual characteristics. We have been especially concerned with the predictive capacities of such measures—prediction of success or failure, of adjustment or maladjustment, of the efficiency with which students live up to their apparent promise as medical students, and of the variety of other factors involved when we focus our attention on the applicants to medical schools.

Historical background

It has been somewhat over a half-century since psychologists, following the early efforts of Binet in France, began studying and developing methods for measuring intelligence. The outcome of these studies has been a multitude of psychological tests of various kinds designed for a variety of

purposes. Through the years there have been innumerable developments—standardization has improved the interpretation of test results by providing comparative norms, and technical problems of reliability and validity have been attacked by a host of competent researchers. Today clinical, educational, and personnel psychologists have a sizable array of dependable tests of intellectual ability at their disposal.

Much was learned about psychological measurement during World War I. Psychologists were called upon to assess the abilities and capacities of hundreds and thousands of soldiers. Out of this effort and the experience gained thereby, much was discovered about the practical problem of appraising human abilities. The development of group tests, both verbal and nonverbal, was particularly significant; the assessment frontiers were gradually pushed back even further.

Since World War I both group and individual tests of intelligence have been refined and are now standard equipment in the armamentarium of psychologists. Indeed, psychological techniques and methods have become common knowledge beyond the field of psychology itself. Members of other disciplines are concerned with the appraisal of intellectual abilities and have a good understanding of how such abilities are estimated through the use of reliable and valid instruments.

Progress in the development of adequate tools for measuring nonintellectual characteristics is more recent. Although a number of tests designed to measure personality and interests were developed during the twenties and thirties—among them some of the best measures of such characteristics available even today—it was during World War II that this area of behavioral measurement was precipitated into the forefront. During this period psychologists became much more closely allied with their medical colleagues in psychiatry in attempting to appraise and understand personality, emotionality, character formation, adjustment, interests, and aptitudes. Much of the impetus toward rapid development was generated by many intensive assessment programs of men in the armed forces.

Personality testing today

Whole new batteries of psychological tests and other methods of appraisal have been developed and, through research involving their use, progress is being made toward more complete and effective understanding of the motivational aspects of human behavior. In general the instruments for evaluating nonintellectual characteristics may be categorized in two groups: (1) the so-called objective tests represented by such tools as the *Minnesota Multiphasic Personality Inventory* (better known as MMPI), the *Strong Vocational Interest Blank*, the *Edwards Personal Preference Schedule*, and many others; and (2) the so-called projective methods represented by such tools as the *Rorschach Ink-Blot Method* and the *Thematic Apperception Test* (TAT). A discussion of the distinguishing characteristics of these two types of approaches to personality and interest measurement is given by Dr. William Schofield in Section C of this chapter.

Even to the professional psychologist, some of these instruments are

strange and peculiar devices at times, and I am reminded of a friend of mine whose young son came home from school with a note from the teacher saying to the parents: "Will you please come to school and see us about Johnnie? He took some psychological tests today, and we are concerned about him." Before the parents took off, they decided they had better talk to Johnnie, so they asked him what had happened at school that day. "Well," said Johnnie, "Some lady came to school and she showed me some things and asked me a lot of silly questions—so I gave her a lot of silly answers!"

Unlike the better-known intelligence measures, many of these approaches to the assessment of nonintellectual characteristics are almost completely unknown outside the fields of psychology and psychiatry. Not only are these measures of nonintellectual attributes relatively unknown, but many of the problems upon which these tests might be focused are only partially recognized, vaguely alluded to, or passed over completely by those concerned with assessing behavioral performance.

Often when such important characteristics as emotionality, character, integrity, and motivation must be considered, the evaluator is in an uncomfortable position because of the general lack of understanding of the nature of such attributes, the lack of sharp definition, and the paucity of information concerning their measurement or estimation. The importance of these problems does not go unrecognized, and the estimator often feels a dismal but appropriate lack of confidence in his ability to evaluate these nonintellectual traits.

The pre-Institute questionnaire was constructed with these considerations in mind, and the Committee felt a real need for much information from all of those who are on the front lines of medical student evaluation and selection. As the tables here in Part III indicate, considerable data has been assembled on current attitudes toward nonintellectual appraisal and on past experiences, current efforts, and future prospects within the several medical schools concerning solution of some of the problems involved.

It appears evident that the formal psychological tests and measurements referred to above and discussed in some detail in Sections B, C, and D are not a common approach to the solution of the problems of nonintellectual appraisal of medical school applicants. Table 4.8 in Chapter 4 shows that in 1956 very few schools were using such techniques and that some schools that had tried certain tests had dropped them. Before the Institute only a handful of medical schools were planning to use tests in the immediate future, but this situation is likely to change as research continues to define, weigh, and measure nonintellectual traits and their implications for the study and practice of medicine.

A note of caution is in order. Psychological instruments must be carefully used, preferably by specialized, well-trained personnel who are familiar with the research literature and understand the standardization, norms, and interpretative aspects of various psychological tests and methods. If such people are not presently on the medical school staff, they may be available elsewhere in the university. The potential savings to be effected by improved

selection procedures and continuous quality-of-student control based upon sound research programs may eventually more than pay the cost of such trained persons. Perhaps we need to take a page from industrial experiences and practices and recognize the importance of research on the process in which we are engaged. We need both individual local research and coordinate research among schools where there can be an exchange of research findings. In this regard I would underscore the suggestion that admissions officers be organized under the aegis of the AAMC. An organization like this would foster such research programs and provide a medium for the exchange of information.

Unquestionably the 1956 Institute will result in much research in our medical schools. As Dr. Carlyle F. Jacobsen, moderator, said in closing the symposium which constitutes this chapter, this whole Institute, with its valuable help from specialists outside the field of medicine, would not have been possible a brief ten years ago when the Committee on Student Personnel Practices was first organized. This is an ongoing process, and it is clear that we are headed straight into the 1957 Institute.

B. Possible Contributions of Psychological Testing of the Nonintellectual Characteristics of Applicants to Medical School

BY DANIEL H. FUNKENSTEIN*
Clinical Associate in Psychiatry, Harvard Medical School

THE PREDICTION OF human behavior in a variety of complex situations has been the subject of intense study and even more intense emotion for centuries. No need before such an audience as this to spell out the great advantages that would accrue to education, industry, and the armed forces if perfect predictive measures were available! However imperfect, psychological tests of various personality variables have been the subject of a number of excellent predictive studies, and this section is concerned with the possible application of these tests and the likely areas for additional research.

At the present time, probably the best established predictive tests of success or failure in medical school are those incorporated in the *Medical College Admission Test* (MCAT). However, as significant as these predictions may be, there are sufficient exceptions to make prediction hazardous in the case of an individual student. This is not to deprecate the contribution of this test battery, but to point out its limitations. As difficult

*The author wishes to express grateful appreciation to G. G. Stern, M. I. Stein, and B. S. Bloom, and also to L. G. Wispe, for the generous use of some of their experimental material. Special acknowledgment also goes to Paul L. Watson who did the drawings for the figures.

as it is to predict success in medical school, we would find it even more difficult to predict success or failure in a medical career.

Predictive measures with very much greater validity will have to be developed before specific levels of test performance can be used as the major criteria of selection for admission to medical school. However, there are other ways of using psychological tests than as predictive measures alone. If we think of admissions in a broader and more positive sense, then psychological tests have much to offer, provided additional research is carried out. In such a context, admissions committees would have multiple functions:

1. Selecting students who will successfully complete medical school.
2. Identifying the positive personality qualities that are associated with the development of able physicians.
3. Selecting students who are most apt to benefit from the program of a particular school.
4. Understanding the personalities of the students admitted and interpreting to both students and faculty the interactions in the relationships among the students, the school, and its faculty. Thus experimental methods, selected by means of previous investigation, could be instituted by the curriculum committee to facilitate the learning and maturing process by better fulfilling the needs of the individual students.
5. Identifying at the time of admission those students who are apt to have difficulties, either emotional or academic. Plans could then be made to help such students surmount their difficulties, either by individual help where indicated or, if such students are numerous, by altering the school situation.
6. Pooling information with other schools to determine which students do well in which schools, so they may enter schools that offer them the maximum opportunity for learning and development. This implies the eventual close cooperation of premedical advisory committees.
7. As a corollary, continuing studies by the admissions committees of themselves, so they may learn some of their individual and collective biases of which they are now unaware. This would result in more objective evaluations of the applicants.
8. In a very special situation (and at our present state of knowledge) psychological tests could be of considerable help to admissions committees, e.g., in the evaluation of an applicant who has recovered from a psychiatric illness.

In this symposium we are concerned with specific types of psychological tests—namely tests that measure personality variables, not tests of intellectual performance capacity, but tests that seek to measure individual personality functioning objectively and by scientifically repeatable techniques. Details concerning the various types of tests and their construction are presented by other members of our panel in Sections C and D. My discussion is oriented toward the possible contribution that such tests can make to the admissions process.

A great deal of work on the study of medical student characteristics is under way, especially under the aegis of this Association under the direction of Dr. Helen Hofer Gee. Still, only after prolonged research will valid information be forthcoming that is applicable to medical schools, their students, and their problems. Although much data will be available in the not too distant future, unfortunately there is little available at the present time. This discussion, therefore, is confined mainly to results of studies involving psychological testing in various undergraduate colleges which can be projected forward to medical schools.

Although it is difficult, if not impossible, to separate what is commonly designated "personality" from the intellectual characteristics of students, we must constantly bear in mind that this artificial separation was made merely to facilitate discussion. This can be illustrated by pointing out that, although the MCAT may be a fairly accurate measure of the intellectual capacity of applicants, there are exceptions in which poor performance on the test is related, not to poor intellectual capacity, but to severe anxiety or to an inability to perform against time. Such cases are rare but emphasize the need to individualize the study of each student. Here we are concerned chiefly with the dynamics of behavior and motivation.

We cannot confine ourselves to psychological tests alone, because in recent years research in the social sciences, particularly sociology and cultural anthropology, has shown that basic personality (whether measured by tests or otherwise) cannot be understood adequately or evaluated properly except in its relationship to culture and the social system. The recency of the development of techniques for making adequate social and cultural studies explains the paucity of such multidisciplinary studies. However, the promise for future research using such techniques is bright.

Psychological personality tests have certain limitations we should refer to before continuing. Space does not allow for discussion of them, but they will be mentioned briefly. Much basic research is needed to construct tests that will surmount the following difficulties:

1. Psychological tests, like medical tests, chemical or physiological, are laboratory tests and can never be used as the sole means of evaluating an individual. They require interpretation by specialists and must be considered with other data on the applicant acquired from various sources.
2. The present standardized tests of personality were for the most part developed and have had their major application in studies of the emotionally "ill" rather than the "well." This suggests more research with these tests in a healthy population and the designing of new tests more applicable to such a population.
3. Personality tests taken under conditions when admission is not at stake are apt to yield different results from the same tests administered when the results are important for admission.
4. Lack of adequate criteria of successful or unsuccessful medical careers. Compounding the difficulties in this area is the great diversity of the characteristics, the abilities, and the roles of doctors in different

specialties. Consider for example, the differences among general practitioners, surgeons, hospital administrators, and psychiatrists.

5. Understanding of the dynamic factors underlying personality functioning requires knowledge of the development of the individual on a longitudinal basis. This means that personality tests must be related to different developmental levels, and this necessitates long-term research. The importance of the student's family in his total psychic economy seems self-evident, yet almost no studies have been made in this area.
6. Most psychological tests assess the individual as he is at a given moment of time. Tests have not yet been developed that indicate accurately the potential or capacity for the growth of the individual if placed in a favorable or unfavorable climate.
7. There are no reliable tests that measure ego function. By ego function we mean the ability and capacity of the individual to handle successfully the various stresses and strains, both internal and external, to which he is subject. As stated by Anna Freud, "The question of mental health or illness is decided not by presence or absence of internal discord, but by the solutions, beneficial or harmful, which the individual ego adopts to solve the discord."[1]
8. To reiterate, psychological tests must be related to the social and cultural background of the individual tested and to the social system with which he is interacting.

Research in all of these areas is needed before psychological tests can be applied adequately to prediction problems. There has been perhaps too much of a tendency to rush into empirical predictive studies before adequate basic research on such tests has been completed. Bearing these limitations in mind, let us see what has been accomplished in some of the studies that have been completed. To simplify and clarify this presentation, certain studies in personality as related to social and cultural factors in various undergraduate colleges have been chosen, and it is regretted that space prohibits mention of other equally good and important research.

It should also be understood that the studies reported here are applicable only for the particular colleges at which they were done. Due to the great differences in colleges, psychological testing may yield quite different results at different schools. The results of some studies may of course prove to be valid at the majority of colleges.

To set the keynote for the discussion that follows, it may be of interest to examine Fig. 1 which shows that, although there is a high correlation between intelligence and academic performance of medical students, there are many cases in which this is not true. Fig. 1 shows clearly that there is considerable overlap despite the relationship between the verbal and

[1]Freud, A. "The Contribution of Psychoanalysis to Genetic Psychology," *Amer. J. Orthopsychiat.* 21, 1951, p. 476.

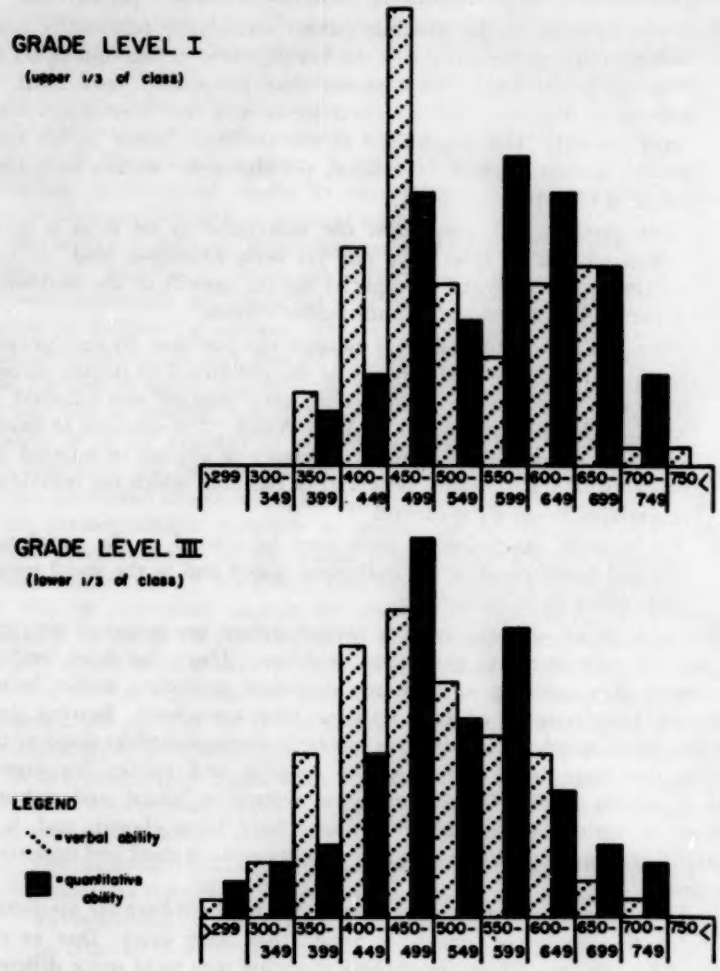

FIG. 1.—The Verbal and Quantitative MCAT scores of a random sample of 10 students from the upper one-third and 10 students from the lower one-third of their classes in each of 8 medical schools (1950-51 freshmen).

quantitative scores on the MCAT and student grades. Some of the students with the highest MCAT scores are in the lowest one-third of their classes, whereas a few of the students with relatively low MCAT scores are in the top one-third of their classes. This suggests that in these students, the underachievers and the overachievers, personality factors are of great importance in explaining their academic performance.

In order to facilitate the discussion, data from a number of different experimental projects are organized under the headings listed below. Material was gathered in some instances by attitude studies, in some by projective tests, in others by motivational tests and perceptual studies, and in still others by observations of student behavior.

1. The students
   - A. Social factors
   - B. Basic personality factors
   - C. Factors within the personality
2. The school
   - A. Cultural values
   - B. Students' attitudes
   - C. Teaching techniques
3. The admissions committee
   - A. Biases of which they are unaware

The students

A. Social factors

There is a high correlation between students' grades in college and their fathers' educations and occupations. Much data attest to this. To demonstrate the consistency of this relationship, let us examine the data from an Eastern college on a group of specially selected scholarship students.[2] These students all had high scores on the *College Boards,* were extensively screened for personality, and had high academic records in secondary school.

Their grades at the end of their first year in college in relation to parents' education may be seen in Table 6.1. Similarly significant associations can be found between college grades of students and their fathers' occupations. Little or no correlation is found between the fathers' *income levels* and the student grades because of the large number of teachers, professors, and ministers whose children make high grades in college.

TABLE 6.1

RELATIONSHIP BETWEEN GRADES OF SELECTED FRESHMEN AT AN EASTERN COLLEGE AND PARENTS' EDUCATION*

Parents' education	Students' freshman grades	
	Top two quintiles	Lower three quintiles
At least one parent college graduate	22	7
Neither parent college graduate	7	15

$\chi^2 = 9.89$ $p < .01$

*Data from Farnsworth, Funkenstein, and Wedge.

[2]Farnsworth, D. L., Funkenstein, D. H., and Wedge, B. *A Study of the Social and Emotional Adjustment of "Early Admission" College Students.* (New York: The Fund for the Advancement of Education, 1957).

Occupation and education are the principal variables used by most sociologists to determine social class. We say then that grades in college are related to social class. The term "social class" is an emotionally loaded one for many, but whether or not we use it or merely say that grades are related to education and occupation, the significant correlations remain. These correlations suggest that academic performance is also related to factors other than intelligence.

Preliminary studies by several social scientists indicate that college families pass on to their children, probably early in life, certain values that lead to good motivation for academic achievement. This does not mean that less favorably educated parents cannot do the same but that they are less likely to do so. Intense research on the determination of the dynamic personality factors involved in this interrelationship between academic achievement and social class is needed. Space does not permit an adequate discussion here of values as related to social class. Kluckhohn[3] has developed techniques for studying such values which might well be investigated using medical student groups.

B. Basic personality factors

Perhaps the most easily understood studies on the prediction of the behavior of college students are those of Stern, Stein, and Bloom.[4] This paper reports some of their work, together with some of our own studies at Harvard. Although the techniques they used in gathering their data differed markedly from our own studies, our results (referred to later) can be placed in a similar frame of reference. These investigators studied the entering freshmen at an Eastern university, using psychological tests they had devised to identify students with clusters of certain personality traits. The clusters were designated as S, N, I, and R types. In this report we need be concerned only with the S and N groups, whose characteristics as described by the authors are given in Table 6.2.

Within their sample of students, the S and N types each form only 16 per cent of the total sample, i.e., those one or more standard deviations from the mean at the two ends of a continuum as shown in Fig. 2. It is important to remember that the S and N types do not represent extreme differences from other students, but merely certain cut-off points on opposite ends of a continuum generated by responses of the entire student body to a group of test items.

These students were tested at the time of matriculation for their freshman year. At the end of this first year they were evaluated from two standpoints: (1) their academic performance using withdrawal as a criterion and (2) their emotional adjustment using the comments and experiences of their advisers, teachers, and the administration as a criterion.

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[3]Kluckhohn, F. R. "Dominant and Substitutive Profiles of Cultural Orientations: Their Significance for the Analysis of Social Stratification," *Social Forces* 28, 1950.

[4]Stern, G. G., Stein, M. I., and Bloom, B. S. *Methods in Personality Assessment* (Glencoe, Illinois: The Free Press, 1956).

TABLE 6.2
DESCRIPTION OF THE S AND N SYNDROMES*

THE S SYNDROME

1. Reactions to Others
   Depersonalization of relationships. Perception of authority figures as omnipotent, threatening, and impregnable.
2. Coping Mechanisms
   Submission to authority. Overwhelming unconscious hostility, displaced externally. Aggression expressed extrapunitively in attempted dominance and control.
3. Impulse Acceptance
   Inhibition and denial of id impulses. Depersonalized sexuality.
4. Impulse Control
   Strong, punitive superego structure, not necessarily internalized. Anxiety and guilt associated with unconscious hostility. Control of unacceptable impulses in order to avoid criticism or disapproval of parent or parent-surrogate is incomplete, resulting in impulse-ridden physical outbursts. Such explosions are noncathartic, only increasing anxiety and guilt.
5. Energy Level
   Ineffectual liberation of effective tension and continual free-floating anxiety drains off energy otherwise available for goal-directed activity. Compensated for by autistic thinking in goal-behavior and fantasied achievement.
6. Autonomous-Homonomous Balance
   Predominantly exocathective-extraceptive: manipulating things and people as external objects through practical, concrete physical action. Conformity and adaptation to reality as given for more-or-less immediately tangible ends, emphasizing money and property. Countercathective rejection of sensuality, introspection, intraception, and verbal-emotional-artistic expressiveness. Egocentric (infantile) perception: animism, anthropomorphism, mysticism, superstition.
7. Self-maintenance
   Repression, inhibition, projection, parnaoia, escapism, masochism, sadism. Denial of negative aspects of self. Concern with physical symptoms, appearance.
8. Organization and Integration
   Sphincter morality, emphasizing obedience, order, punctuality. Despite stress on arrangement and detail activities tend to be diffused and conflicted due to uncontrolled anxiety. Rigid set and outlook; inaccessible to new experience. Resistance to departure from tradition. Rigid and compulsive.

THE N SYNDROME

1. Reactions to Others
   Highly personalized relationships. Perception of authority figures realistically, frequently as overprotective or overpossessive.
2. Coping Mechanisms
   Identification with cathected objects. Conscious rebellion and overt rejection of negative or ambivalent cathexes. Aggression expressed freely and directly in attempt to maintain inviolacy, autonomy, and independence. Generally characterized by maintenance of good contact and rapport with others.
3. Impulse Acceptance
   Acceptant of id impulses. Capable of direct sentient and sexual representations, as well as their sublimations.
4. Impulse Control
   Balanced ego-id-superego demands. Anxiety associated with conscious hostility more focussed, more readily verbalized and dissipated. Internalized superego. Conflict conscious and verbalized. Capable of responsibility and emotional maturity.
5. Energy Level
   Capable of sustained effort for remote goals.
6. Autonomous-Homonomous Balance
   Predominantly other-directed, placing great emphasis on interpersonal relationships. Identification with "underdog," and capacity for dramatic, idealistic social action. Sensuous, introspective, intraceptive. Verbal-emotional-artistic sublimations.
7. Self-Maintenance
   Counteraction. Exhibitionism and self-dramatization. Capacity for realistic self-appraisal, introspection.
8. Organization and Integration
   Behavior plastic and labile. Capacity for spontaneity, impulsiveness. Mobile and intense emotional responsiveness. Flexible, adaptable to changing circumstances.

*As described by Stern, Stein, and Bloom in *Methods in Personality Assessment* (Glencoe, Ill.: The Free Press, 1956).

First let us examine the withdrawals from college in Table 6.3. Group S contains a significantly greater number of withdrawals than the N group. Table 6.4 shows that in terms of good adjustment or poor adjustment, a significantly greater number of the students in the S group made poor adjustments than those in the N group. If we now combine the adjustment data with the withdrawal data as in Table 6.5, we find a markedly significant difference between the two groups.

These figures are truly impressive, but reveal several pitfalls in the use of psychological test data. If an admissions committee had excluded all of the S students, the 47 per cent that did well would not have been admitted. In addition we find that of the S group only 23 per cent actually withdrew, and we do not know how many of these might have

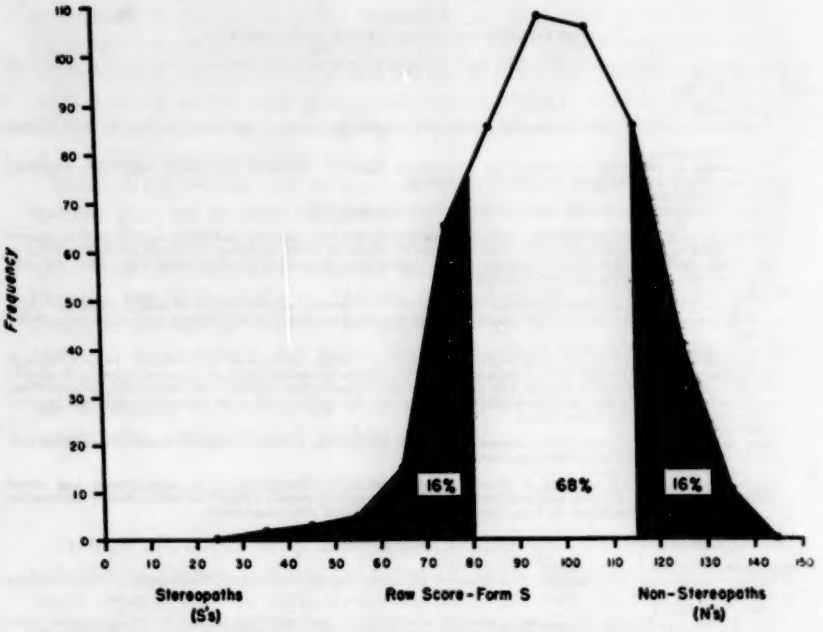

FIG. 2.—The distribution of scores on the test form used by Stern, Stein, and Bloom for 514 college entrants. (From *Methods in Personality Assessment.*)

succeeded with more help or in a different school. We also have to consider the 30 per cent of this group who made a poor adjustment, because a great number of them, particularly if given aid, are likely to succeed eventually. One difficulty with providing such help by the college psychiatrist is that students classified into the S group are not apt either to seek psychiatric help or to continue it if referred for treatment.

Stern, Stein, and Bloom's figures on this last point may be seen in Table 6.6. This table shows very clearly that the S group does not seek psychotherapeutic help. Our own studies at Harvard suggest similar

TABLE 6.3

WITHDRAWAL OF TWO TYPES OF STUDENTS FROM COLLEGE AT END OF FIRST YEAR*

Type	Students	
	Withdrawn	Still in college
S type	19 (23%)	62 (77%)
N type	1 (1%)	80 (99%)

$\chi^2 = 16.49$ $p < .001$

*Data from Stern, Stein, and Bloom.

TABLE 6.4

ADJUSTMENT OF S- AND N-TYPE STUDENTS AT END OF FIRST YEAR*

Type	Students with	
	Poor adjustment	Good adjustment
S type	24 (30%)	47 (70%)
N type	12 (15%)	67 (85%)

$\chi^2 = 7.10$ $p < .01$

*Data from Stern, Stein, and Bloom.

TABLE 6.5

COLLEGE WITHDRAWAL AND ADJUSTMENT IN RELATION TO STUDENT TYPE AT END OF FIRST YEAR*

Type	Students	
	Withdrawn plus poor adjustment	In college, good adjustment
S type	43 (53%)	38 (47%)
N type	13 (16%)	68 (84%)
	$\chi^2 = 24.56$ $p < .001$	

*Data from Stern, Stein, and Bloom.

TABLE 6.6

POORLY ADJUSTED S- AND N-TYPE STUDENTS IN PSYCHOTHERAPY DURING THEIR FRESHMAN YEAR*

Type	Poor adjustment group	
	In psychotherapy	Not in psychotherapy
S type	3 (17%)	21 (83%)
N type	5 (43%)	7 (57%)

*Data from Stern, Stein, and Bloom.

findings. Studies at the University of California[5] found that S-like students[6] will fail to continue psychiatric treatment beyond a few interviews.

Our own studies, not yet completed, suggest that students with the S-like personality who manage to remain in college and graduate represent three types of adjustment: (1) those whose attitudes change and whose behavior becomes more mature—the most frequent solution and one accomplished with considerable travail in many cases; (2) those who do not change but isolate themselves from their peers and develop rigid defense mechanisms; and (3) those who find a small, similar outgroup whose members afford them psychological support and thus enable them to function—such students may be said to acquire a "technical" education rather than a general one. (See Fig. 3.)

There are now no reliable tests for the S group, or any other group, to differentiate those students who will grow, mature, and change from those who will not. In psychoanalytic terms such measures would be measures of ego strength, i.e., the ability to master actively, at a mature level, problems within and outside of the personality. Measures that define personality types, such as the S and the N, tell us what the student is at the time he is tested, but almost nothing of his potential for growth or how he handles his problems.

In summary, if we were to exclude from admission students falling into certain types, we would exclude a great number with the capacity for change, growth, and the successful completion of college. Under these circumstances, research is indicated to develop measures of the capacity for growth and development in a particular college setting. Further research should be made into techniques by which students who are apt to have difficulties can be helped, either by possible changes in the social structure of the school or by new techniques for dealing with such students. Later reference will be made to Wispe's work which shows how certain teaching methods compound the difficulties experienced by certain types of students.

[5]Hecht, S., and Kroeber, T. C. "A Study in Prediction of Attitudes of Patients Toward Brief Psychotherapy," (in preparation).

[6]The term "S-like" is used here and throughout to designate characteristics similar to those of the S-type student delineated by Stern, Stein, and Bloom, although the populations and techniques for studying them are different. The same is true of the term "N-like."

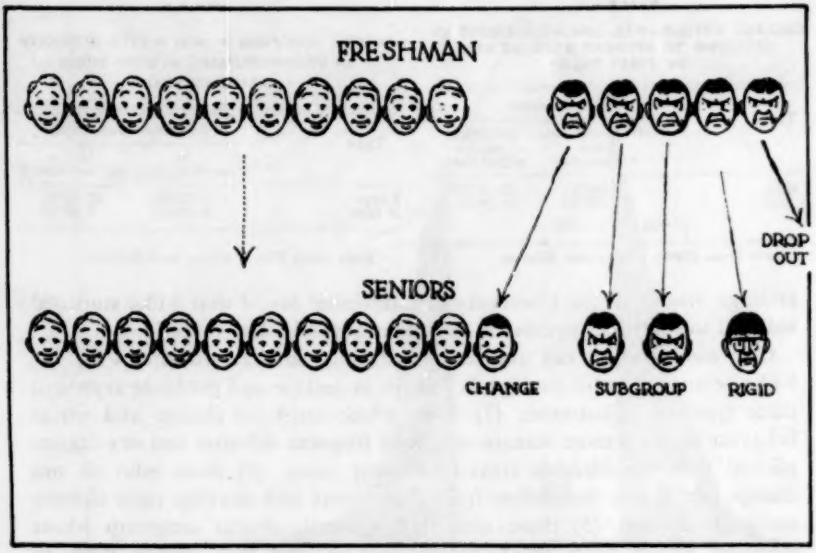

FIG. 3.—Diagramatic representation of different outcomes in college for students whose attitudes are markedly deviant from their classmates (high scorers on authoritarian scales).

Another weakness of psychological testing in relation to personality types is evident in Stern, Stein, and Bloom's work. Their Type S and Type N each represent but 16 per cent of the total student body. It should be noted, however, that the data reported here are from one of their earlier studies. Identification of S and N types for this study was made by means of ideological items only. Since then, more basic personality measures have been developed which have increased the number of S- and N-type students that can be identified. These investigators believe that identification by typological means, rather than by simply isolating the two ends of a continuum, will increase the number of students on whom predictions can be made. They also believe that study of additional type delineations (such as the R and I types mentioned earlier) will further increase this number.

C. Factors within the personality

Increased understanding of student personality types can be acquired by looking below the surface on a deeper level within their personalities and also by examining related sociological factors. The work of Stern, Stein, and Bloom in this area is not reported here, but we will look at some of our studies at Harvard College.[7] Let us consider the perceptions

[7]Funkenstein, D. H., King, S. H., and Drolette, M. E. *Mastery of Stress* (Cambridge, Massachusetts: Harvard University Press, 1957).

S-LIKE

- RIGIDITY
- CERTAINTY
- LITTLE CONSCIOUS GUILT OR ANXIETY
- LITTLE INTROSPECTION
- LITTLE AWARENESS OF PSYCHOLOGICAL FACTORS
- STRONG DEFENSES

N-LIKE

- EXTREME FLEXIBILITY
- MANY DOUBTS
- CONSCIOUS GUILT AND ANXIETY
- MUCH INTROSPECTION
- MARKED AWARENESS OF PSYCHOLOGICAL FACTORS
- MODERATE DEFENSES

FIG. 4.—S-like and N-like students; their perceptions of the relative importance of one parent in relation to the other as the chief source of authority and affection and as the role model.

by students of their parents. By means of psychological tests, the relative importance of one parent in relation to the other as the chief source of authority and affection and as the student's role model was determined. These perceptions were closely related to the continuum at one end of which were S-like students and at the other end N-like students. (See Fig. 4.)

At the end of the continuum containing the S-like students were the men who perceived father as the chief source of authority and affection and as their role model. Mother was perceived as of little importance in the family. Their relationship with their father was a mixture of resentment and affection.

Next on the continuum were those who described a dramatic difference between their parents. Father was seen as stern, authoritative, and difficult. Although their relationship with him was poor, they chose him as their role model. Mother on the other hand was kind, understanding, extremely permissive, and their chief source of affection.

Still further on the continuum were the men who described their families as cooperative ones. Although father was seen as the chief source of authority and chief role model, and mother as the chief source of affection, father shared some of his authority with mother, and mother some of her affection with father. The boy's relationship with his father was very close.

At the far end of the continuum containing the extreme N-like students were the men who were closely related to their mothers, perceiving them

as the chief sources of authority and affection and as their role models. Father was absent due to death or divorce or described by their sons as "Casper Milquetoast" characters.

These perceptions illustrate the extreme importance of the family as a determinant of personality. Understanding the type of family gives added dimension to understanding of a student's personality. Using the perception of parents alone, it was possible to predict significantly which students at a military school would not do well. These were students who perceived their fathers as extremely authoritative and with whom they had a poor relationship.

Another important facet of understanding students, and one on which little work has been done in relation to success or failure in college, involves the deeper recesses of personality of which the students are unaware and which is termed "unconscious material." The *Rorschach* and the *Thematic Apperception Test* (TAT) are projective tests that enable us to make inferences about this personality area.

In our own work at Harvard College, the fantasies of the students as determined by the TAT were related to their reactions during stress and to many other facets of their personalities and behavior, including the S-like–N-like continuum. Understanding these fantasies, it is possible to understand behavior. If we had such studies of medical students specifically, perhaps we could understand better their reactions in medical schools. Of especial importance would be an understanding of their fantasies of what a doctor is.

The school

From these considerations of the individual student, let us now turn to a consideration of the differences in the schools themselves. These will be discussed from the standpoint of cultural differences, students' attitudes, and teaching techniques.

A. Cultural differences

The great strength of education in America is its diversity—different schools have different values and educate in different ways. Certainly this is true in medical schools, no less than in colleges. It is not a question of what is good or bad, best or worst, but rather that different schools fulfill different needs of students and of society. We need many types of schools and many types of students.

In assessing the degrees of success of a student in college, it is necessary to understand, not only his basic personality and cultural background, but also the characteristics of the school as a social system. When a student enters a college or medical school where the values of the school and of its faculty and student body differ markedly from his own, a strain is

placed on that student–strain defined as a large or unusual demand on a student's emotional resources. Such students, according to our studies, either adopt the new values of the school; withdraw, rebel, and come into disciplinary difficulties; isolate themselves from the rest of the student body and develop rigid defenses; or surround themselves with similar students who give them psychological support. Given basic differences between attitudes and values of an individual student and that of his chosen school, the type of solution he chooses to solve the conflict depends upon that aspect of his personality which in psychiatry we label "ego function."

We are not acquainted with any studies of differences in the social and cultural structure of the various medical schools, and only very limited studies of differences in value systems of colleges have been made. Among these last named were those of Farnsworth, Funkenstein, and Wedge referred to earlier. In a study of Early Admission Students for the Fund for the Advancement of Education, these investigators found it necessary in evaluating the students to consider each school separately. It was found that students at one school had values that were primarily suited for a pragmatic education, whereas at the other end of the continuum were students whose values were more suited to an ideistic type of education.

Some definitions are in order at this point. A *pragmatic* culture is here defined as one in which the emphasis is on work and achieving concrete goals. Little value is given to introspection, to ideas in the abstract, to the arts, or to literature. In contrast to this, in an *ideistic* culture there is great concern with introspection, with self-understanding, with abstract ideas, with the arts, and with literature. In this latter culture, the Socratic dictum "know thyself" is all-important.

One of the chief causes of failure was found to be the placement of students with values characteristic of a pragmatic culture in a school or course of study primarily ideistic in orientation. This was strikingly seen in one college where the majority of students, although pragmatically oriented, were placed in liberal arts courses, one of which was taught by a very ideistically oriented professor. Within a few weeks almost all of the students rebelled and refused to continue with the course because it was not practical. However, it should be noted that a minority of these students felt they got a great deal from the course and that an entirely new vista for seeing things was opened for them.

Here again, if an admissions committee understood the prime values of its school as a cultural system, and understood by intense psychological testing and other means the personalities and social and cultural backgrounds of its students, selecting the students most apt to benefit in this particular school would be on a firmer scientific basis. Certain students, who were apt to have difficulties in a particular school but were still desirable candidates because of other overriding assets, might be identified, their problems understood–and then, if necessary, special efforts made to help them succeed. Only a minority of such students might need psychological help, and they could be encouraged to obtain it. On a

theoretical basis, the opportunity for a student to work closely and identify with a mature faculty member as tutor or adviser would be much more to the point in helping the majority of such students to adopt new values, change attitudes, and grow. To put into effect such an ideal program will require years of research into the factors involved.

B. Students' attitudes

To show the striking differences in the attitudes of students at different colleges, let us examine two sets of data: (1) value for introspection and (2) authoritarian attitudes.

Funkenstein, Wechsler, and Merrifield devised a test (unpublished) to measure attitudes concerning value for self-understanding and introspection. This was one of the variables upon which pragmatic and ideistic college cultures could be differentiated. This test was then administered to a random sample of incoming freshmen at two colleges. The differences in attitudes of entering freshmen in these two colleges may be seen in Fig. 5.

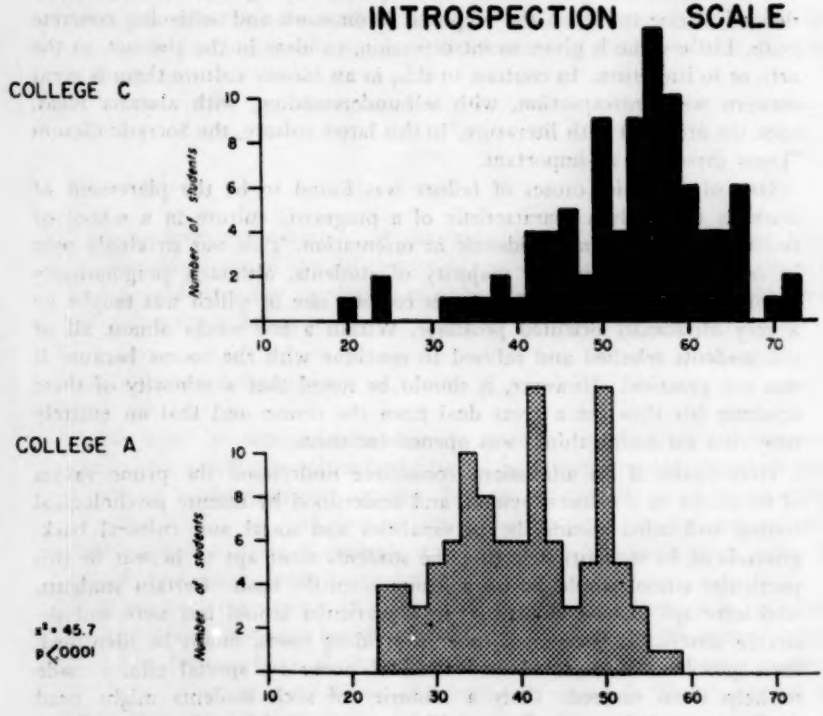

FIG. 5.—Differences in scores on a test of "value for introspection" at two colleges.

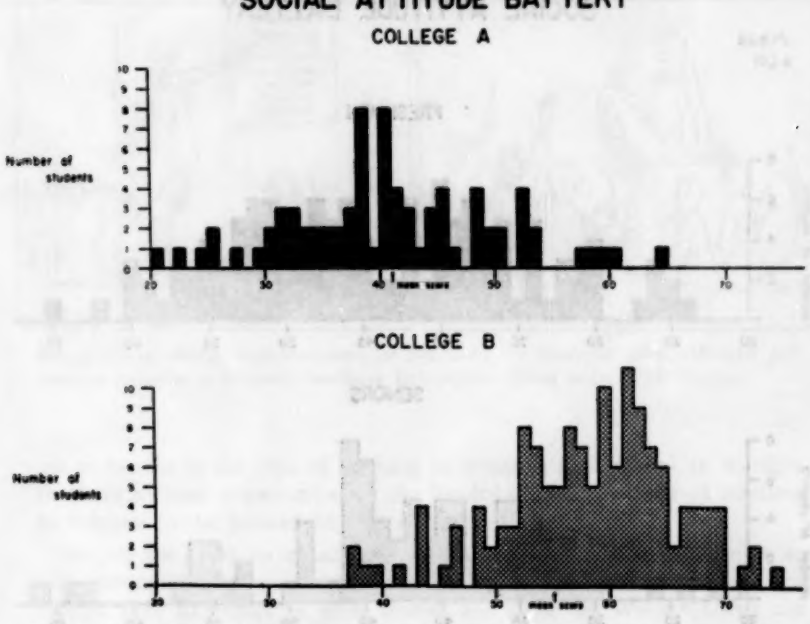

FIG. 6.—*Social Attitude Battery* scores of a random sample of students at two colleges.

The mean differences between the two college groups are significant beyond the .001 level, and differences in these attitude scales are not related significantly to intelligence.

Further data was collected by myself at two New England colleges through use of a battery of attitude scales measuring authoritarian attitudes. These scales were devised by Levinson[8] as an extension of the scales he and his collaborators used previously. They measure attitudes relative to belief in authority as a solution to problems and to ethnocentricity and belief in a traditional family pattern.

We find markedly different attitudes in the student bodies of two different colleges as measured by these tests (Fig. 6), and these differences are significant beyond the .001 level. When a student deviates markedly from his classmates in attitude, a marked strain is placed on him and his success or failure will depend on his ability to handle this strain. We may raise the question: In which schools do which students succeed? Again research is needed. That students' attitudes do change during their four years at college may be seen in Fig. 7.

[8]Levinson, D. J. "The Intergroup Relations Workshop: Its Psychological Aims and Effects, *J. Psychol.* 38, 1954, p. 103.

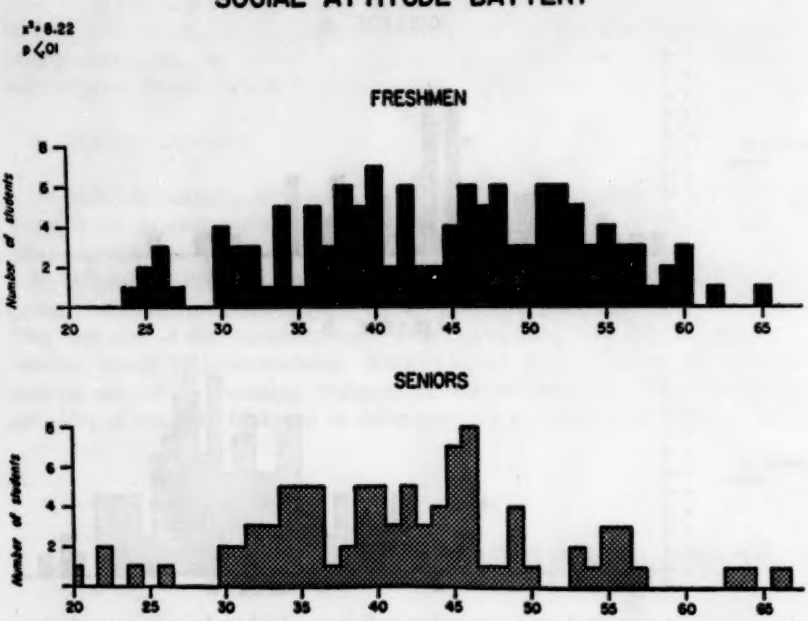

FIG. 7.—Comparison of *Social Attitude Battery* scores of freshmen and seniors at an Eastern university.

Such data is also needed on medical students, not only on such a test of social attitudes as this, but especially in regard to the dominance of certain values in the students in that particular school. If we knew, as a result of research, that in a certain school students with certain attitudes and certain personalities, despite adequate preparation and adequate intelligence, did not do well, several courses of action would then be opened. They could be denied admission on this criterion with an effort made to place them in the proper school. Or they could be admitted and then helped to succeed by altering some of the attitudes of the school toward such students, or by giving them special help so that they would be able to handle the stress and strain incident to their deviance from their classmates. I merely pose this question. I have no answers, but it is an area of great importance that needs study and thought.

C. Teaching techniques

The next point to examine is the effect of various teaching methods used by faculties on the learning of different types of students. Knowledge of this factor would enable admissions committees to select students most

FIG. 8.—Diagramatic representation of reactions by students with different personality patterns to different teaching techniques. (Data from L. G. Wispe.)

apt to benefit by the type of teaching in vogue at their school, or it might result in a closer examination by the faculty of their methods of teaching in relation to the individual student's needs.

Despite the great importance of studies relating teaching techniques to the personalities of pupils, only limited studies in this area have been carried out. Examples of such studies are those by Wispe.[9] Using the TAT and a sentence-completion test, he found that he could delineate students at the two ends of a personality continuum which were again similar to the S and N Types of Stern, Stein, and Bloom. The variable emphasized by Wispe, however, was extrapunitiveness versus intropunitiveness, i. e., placing blame on others versus on the self.

He divided teaching techniques into two types: *teacher-centered* and *pupil-centered*. In teacher-centered teaching the lecture method was used, the content of the course was highly organized, and the teacher was extremely authoritative. In pupil-centered teaching the discussion method was used, the content of the course was loosely organized, and the teacher was extremely permissive. Wispe found that most students learned equally well in both sections, with the poorer students doing better in the teacher-centered classes. However, at the two ends of the personality continuum, the learning of the individual student was related to the interaction between his personality type and the teaching method. The very extrapunitive (S-like) students learned best in the pupil-centered classes and poorest in the teacher-centered classes. In the latter classes they expressed a great deal of resentment and hostility. These same students when placed in a pupil-centered class, able to proceed on their own and express their feelings, learned much more, probably because they were not in conflict with the teacher.

[9]Wispe, L. G. "Evaluating Section Teaching Methods in the Introductory Course," *J. Educ. Res.* 45, 1951, p. 161.

In marked contrast to this, the intropunitive students (N-like) learned best in the teacher-centered classes and poorest in the pupil-centered classes. This demonstrated their great need for an authority to lean upon and for a structured situation. In a permissive situation, they become extremely anxious and learned much less. Understanding of the underlying dynamics of the personalities of these students allows one to predict such reactions under such conditions. (See Fig. 8.) It should be emphasized that Wispe's studies were carried out at one particular college, and different results might well be obtained at other colleges.

Data such as this about their own school, particularly about teaching methods used, would give clues to admissions committees concerning problems certain students may have in their school. Ideally, teaching should not be of one type or another, but should fill the needs of the particular individual student. Research into teaching methods as related to the personalities of students is an important area for study, and adequate techniques for carrying out such studies are available.

The admissions committee

The study of the biases of which men are unaware has been one of the major contributions of psychoanalysis. Let me give you an example of the kind of error admissions committees can make without awareness. In the above-mentioned program for the so-called "Ford Scholars," concern was expressed by some faculty members at one school that these scholars, younger by an average of two years than their classmates, would be handicapped by their small size. A year later when someone remarked on the large number of tall men among the group, an examination of their heights showed them to be significantly taller than their older classmates. The admissions committee was unaware that they had used height as a criterion for admission; actually the large pool of applicants contained many able students of average height. (See Fig. 9.)

Although most admissions committees do a fine job, studies to discover any biases of which they may be unaware are important.

Further areas for research

A. Motivation

It is a common statement, amounting almost to a cliche, that students who do poorly lack motivation. Motivation is a complex subject and cannot be discussed in detail here. Studies of the dynamics of motivation as related to personality and cultural and social factors are needed, however. Motivation can be understood at many levels of the personality. In many cases the student is unaware of his true motivation, for it is unconscious. Understanding the underlying dynamics of the applicant's motivation for a career in medicine is of prime importance.

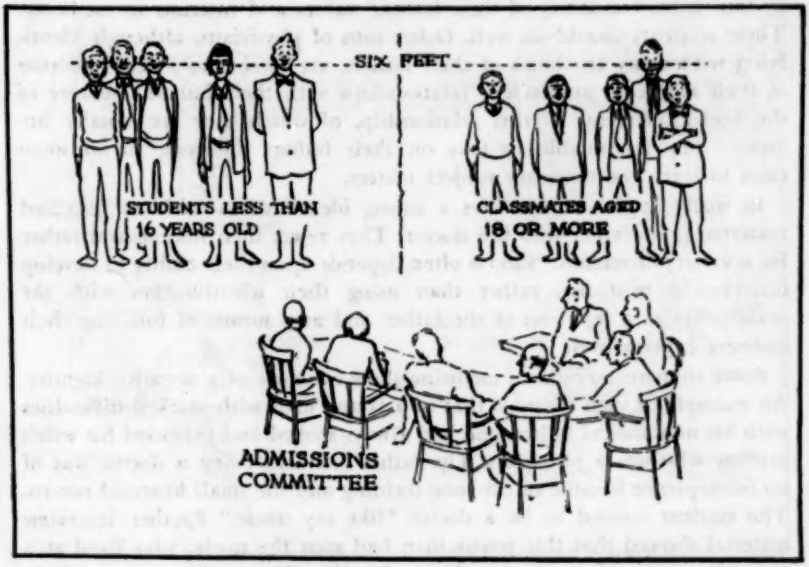

FIG. 9.—Diagramatic representation of the heights of Early Admission Students selected by an admissions committee in comparison with the heights of their older classmates.

Motivation is related chiefly to the internalized values, interests, sense of identity, and identifications that an individual has, and it is perfectly possible to be highly motivated for the "wrong" reasons—for example, the M.D. degree may be sought for monetary gain. Few studies of the value systems of medical students have been completed, but there are many possibilities. The *Strong Vocational Interest Blank* enables us to make some inferences about motivation, for when students' interests coincide with those of members of a given profession, studies have shown that the motivation of such students is apt to be good for that particular profession. Properly employed, this test is a very valuable instrument. However, even here McArthur[10] found that the predictive value of this inventory was entirely different for boys from different cultural backgrounds.

Let us look at some of the many dynamic factors at work in reaching a decision to go to medical school. Of great importance is the student's identification with a person whose attributes he seeks to emulate and incorporate within his own personality. Such identifications, particularly when made with mature persons, promote psychological growth and motivation.

Many sons of physicians identify with their fathers and incorporate

[10]McArthur, C. "Long-Term Validity of the Strong Interest Test in Two Subcultures," *J. Appl. Psychol.* 38, 1954, p. 346.

within themselves many of their fathers' values and interests in medicine. These students should do well. Other sons of physicians, although identifying with many attributes of their fathers, are unable to succeed because of their markedly ambivalent relationships with their fathers. Because of the hostile elements of this relationship, of which they are usually unaware, they are unable to take on their fathers' interests, or in some cases to learn the necessary subject matter.

In many applicants one sees a strong identification with an idealized maternal grandfather who is a doctor. They reject their nonmedical father for a variety of reasons. Success often depends upon their ability to develop interests in medicine, rather than using their identification with the grandfather as a rejection of the father and as a means of fulfilling their mothers' expectations.

Some students going into medicine show evidence of a negative identity. An example of such a case is that of a young man with marked difficulties with his nonmedical father who had always scoffed and ridiculed his wife's brother who was a physician. The father felt that being a doctor was of no consequence because of the long training and the small financial return. The student wanted to be a doctor "like my uncle." Further interview material showed that this young man had seen the uncle, who lived at a great distance, only once or twice in his life. The applicant knew little about the medical profession and had few interests in medical matters. In this case, the motivation for medicine rests on a reaction against his tyrannical father. This is not apt to lead to a satisfactory career.

A similar case, with a different type of motivation, is that of a student with a difficult, hostile father who was so opposed to medicine that he would not let his children receive vaccines. The son in rebellion against the father decided on medicine as a career, but in this instance, after rejecting the father, he formed a close relationship with a doctor who represented a parental surrogate. This student developed many interests in medical matters and is likely to be a successful doctor.

Extremely able students from the academic standpoint may often succeed in a profession but may be unhappy in their professional life and regret that they did not pursue a different career. Studies like that of McArthur, mentioned above, indicate that in many such instances the students do not have the interests usually found among individuals in this profession. (See Fig. 10.) Among students whose fathers are physicians, the greatest likelihood of professional satisfaction exists when the student's identification is with those attributes of the physician father that include interests and values, and when the student has the type of relationship with his father that will enable him to act on them.

Many fathers continually say they have not influenced their son's choice of career in any way. By this they mean in a verbal manner. Identification and the influencing of attitudes usually take place on a much deeper level and on a nonverbal level. A striking example of this is a very successful medical student who is the first person in his family to become a physician. For as long as he can remember this has been his ambition. After

FIG. 10.—Diagramatic representation of medical students and their fathers.

his admission to medical school, his father, a successful businessman, told him: "This is uncanny. I never told you, but all my life I wanted to be a doctor. In fact, I was a premedical student in college myself, but changed courses when my father disapproved because someone had to carry on the family business. At that moment I decided that never in my life would I influence my son's career choice in any way. I have tried to live up to this resolution. In fact, I never even told your mother that my ambition had been to go to medical school."

The dynamic factors illustrated here are but a few of the many operating in individual cases. This is a fertile field for research but a most complex one.

B. The psychology of becoming a physician

Still another area needing study is the understanding of personality factors involved in withstanding the psychological strains of being a medical student and becoming a doctor. The excessively dependent positions in which such students are placed, the inadequate outlets for their hostilities, the problem of authority toward patients and from the faculty, feelings of intense competition with one's peers with whom one is supposed to be on the best of terms, and coming face to face at close range with the problem of death, often for the first time—these are only a few of the

strains. At the same time that their contemporaries in other fields are earning an adequate living and establishing themselves in society, medical students are kept in a state of prolonged adolescence. Despite this, we demand that they show mature judgment and, upon graduation, we expect them to show qualities of independence.

It is true that most of our students withstand these vicissitudes and succeed, but at what cost? When such problems are imperfectly mastered, society bears the cost in the ability of this doctor to function at his optimum, particularly in his relationship with patients. When, by research, we have a better understanding from a dynamic standpoint of the significance of being a medical student and becoming a doctor, we can do a better job of selecting students and providing an education which, in addition to imparting technical knowledge, helps students become good physicians in the best meaning of the word.

C. The students who make a late career choice

Many very able men in all fields have had many difficulties during adolescence and have tried several professions before settling on their final career choice. Alan Gregg characterizes them as "late bloomers" and from the psychiatric standpoint they may be described in Erikson's terms as late in establishing their "identity." Different individuals mature at different ages; they follow no timetable.

At the present time, and particularly in the near future when the enrollment of colleges will increase by leaps and bounds, colleges and medical schools with highly selective admission procedures are in danger of admitting only the "early bloomers." In such a highly competitive system, there will be little room for those people who need to experiment with various roles during youth. The luxury of making mistakes and profiting from them at this time of life may well be a thing of the past—the slightest mistake and one may not be admitted to college.

Some men who make a late career choice represent "late bloomers" who will have productive professional lives. Other men with late career choices represent highly neurotic individuals who will not stay in the profession; they are still seeking to "find themselves" and the study of medicine is but another temporary step in the process. Research directed toward distinguishing between these types of applicants is needed.

Conclusion

This has been a fleeting coverage of a wide variety of material, and yet we have far from exhausted the field. Again it should be emphasized that there are many approaches to testing the personality of students, and those emphasized here are those with which the author has the most familiarity. Research of equal importance in other areas should be implemented. I hoped that by painting a very broad canvas we could show some of the possible contributions that such studies could make to medical

education and to the more fundamental knowledge of personality in relationship to cultural and social factors.

Moving the admissions process and the entire study of human personality onto a more scientific basis will require years of research by a number of investigators before many of the problems posed can be solved. One of the major factors holding back such work is the great resistance to such studies by both students and faculties, much more on the side of faculties than students. Human behavior and values are open to scientific investigation the same as any other phenomenon. A bare beginning has been made. If this recalls the time in medical history when disease was believed due to demons and devils—and the consequent difficulties encountered by early investigators in studying by scientific methods the physical ills to which man is subject—it should make us optimistic, for those obstacles to progress were overcome. Indeed the climate for behavioral studies has improved vastly in the past few years and we look forward to more improvement in the near future.

A charge frequently leveled against the use of psychological testing in selection procedures is that reliance on such techniques will lead to the selection of men who conform to certain patterns. The "well-adjusted," unimaginative conformist will always be the man selected. The unusual, imaginative maverick who is apt to be the real contributor, but who does not fit this conformist pattern, will be eliminated. This allegation reaches its summation in W. H. Whyte's book, *The Organization Man*,[11] which contains a chapter entitled "How to Cheat on Personality Tests." By following the author's instruction, the nonconformist will be able to obtain a conformist pattern on these tests, thus assuring his selection by the psychologist for the position.

Without going into the ethics of encouraging cheating in any form, many authors show little real knowledge of the purpose of testing. Certainly such tests could be misused by people without training in testing, but this is not a peculiarity of psychological tests per se, but of all laboratory tests, including those most in use in medical practice. Currently much research is needed on the identification of the mavericks, but beyond this we must distinguish between the maverick who will be a real contributor and the one whose deviance merely represents nonproductive egocentricity. This is one of the most difficult problems medical school admissions committees face. They are well aware of it and welcome any help that psychological testing can give. The psychologist and psychiatrist are not trying to eliminate the nonconformist or those with anxiety or other similar traits. As stated in a Report of the World Federation for Mental Health,[12] "Anxiety and tension are often prerequisites and accompaniments of creativity; one criterion of maturity is the ability to stand apart from the crowd when conditions indicate." Anxiety and tension of a crippling

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[11] Whyte, W. H., Jr. *The Organization Man* (New York: Simon and Schuster, 1956).

[12] Funkenstein, D. H. (ed.) *Report of First International Conference on Student Mental Health* (World Federation for Mental Health, in preparation).

nature that interfere with functioning are entirely different from the anxiety and tension incident to productivity and creativity.

Many feel that the social scientist and psychiatrist wish to turn educational institutions into vast social laboratories which they will control. Far from it. There are many disciplines outside of these fields that have been contributing for many years and will continue to contribute to the solution of the problems discussed in this paper. We merely wish to cast some new light and to arouse some awareness of factors that are often neglected. Understanding such factors can help administrators to make more knowledgeable decisions and can provide a basis for professors to improve their teaching.

Perhaps many will say that I have overstated the case, and perhaps I would be the first to agree with them. However, I have deliberately tried to show the possibilities of long-term research studies in rather idealistic terms because I believe that eventually such studies will be made and that they will contribute greatly to the advancement of medical education. Perhaps, I might justify myself by quoting James Thurber: "Fools rush in where angels fear to tread, and the angels are all in heaven, but few of the fools are dead."

C. The Use of Objective Personality Tests in Selection of Medical Students

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Introduction

WITH RESPECT TO questions as to what constitutes theoretically elegant, methodologically sound, and empirically verified ideal approaches to detection and measurement of personality, the science of psychology (and its closely allied medical specialty, psychiatry) are currently characterized more by controversial opinion than by convincing fact. In such a situation, where opinion greatly exceeds or possibly even neglects evidence, it is common for thought to become ideological rather than ideational. Boundaries are drawn too sharply, relationships are overly simplified; the technicians fall into categorical thinking and do research to prove convictions rather than to discover fact, and the unsophisticated are likely to be drawn to the side that is most luxurious in its claims. This is much the situation as regards the pseudo-issue of projective versus structured personality tests. For broad purposes of mental hygiene it would be helpful in all our subsequent deliberations concerning these two types of instruments if we should refer conscientiously to *so-called* projective and *so-called* structured devices. Let the case for the close relationship and basic similarity of these two classes of personality instruments be suggested by the following comments.

Projection, as a term applied to the rapid assignment of some kind of meaning to relatively new or strange experiences as a function of past experiences and current motivations, is a universal phenomenon of human psychological functioning; it is not a function that occurs only under certain circumscribed stimulus conditions. *Structure,* in some degree, is a universal property of all stimulus situations inasmuch as they are constituted of various arrangements and magnitudes of energy systems; thus there is structure in phenomena as relatively formless and changing as the clouds.

These two points may be illustrated by a card of the Rorschach, a projective test, and by a structured test item such as "I drink unusually large quantities of water." The fact that a given portion of a Rorschach card gives rise to a certain percept with high frequency (e.g., side detail in Card VIII is reported as some kind of animal by a large per cent of normals) reveals that there is a degree of structure in this projective test. Likewise, the person responding to the structured test item necessarily projects his notion of the meaning of "unusually large" as applied to quantity of water consumed, and there will obviously be large interpretive differences (projections) among even those subjects who give the same response.

There are no existing general theories of the origins, development, dimensions, and organization of personality that exclude either the so-called projective or so-called structured approaches as appropriate media of investigation. What we call projective methods can be and in rare instances have been applied in typically structured (or objective) ways, and the structured tests can be analyzed projectively. *In esse* structure and projection are psychological constructs that are functionally related and mutually present in various proportions in a large class of stimulus-response situations of both a casual and test nature.

As indicated by the title of this paper, the term "objective" is frequently used as a synonym for the word "structured" in referring to instruments of the questionnaire or inventory type. It should be understood that such reference is appropriate only with respect (1) to the fact that so-called structured devices lend themselves somewhat more readily to objective application, validation, and interpretation than so-called projective techniques; (2) to the fact that objective methods have been more consistently applied to all levels of development and appraisal of so-called structured tests than to so-called projectives; and (3) to the fact that, at present, satisfactory objective evidence as to the relative validity of the two types of instrument in predicting identical criteria, though small in amount, reads in favor of the structured tests.

It should be understood that objectivity is a property of scientific method and not a peculiarity of certain stimulus complexes. Ultimately some so-called projective procedures could be appropriately designated as objective. Whether one thinks of scientific study of personality as dating from Binet's suggestion in 1895 that inkblots be used to study imaginative processes of children (the historical antecedent of projective diagnostics) or from the work of Heymans and Wiersma in 1905 in developing a symptom inventory to assist Dutch physicians in detecting emotional disturbances in their

patients (the historical antecedent of the structured questionnaire), personality study is a young science. It may prove that identification of objectivity with the structured approach is an historical relativity.

Characteristics of objective personality tests

Personality tests of the so-called structured type have been prominent on the American scene since the closing years of World War I. Following World War I, instruments of this type proliferated rapidly, producing a conglomeration of questionnaires that shared certain serious weaknesses, as detailed by Dr. Strother (see Section D of this chapter): (1) the various pools of items tended to sample very restricted areas of personality; (2) the various scales of the instruments were of a priori origin, i.e., based on clinical opinion as to what constituted a clinically significant or deviant item response; (3) the tests appeared extremely susceptible to distortion or faking because of the psychological obviousness of the items; and (4) the most serious weakness was that they simply failed to yield significant help when applied in practical situations of personality diagnosis, i.e., in schools, industries, clinics, and hospitals.

Since 1940, a long series of research studies concerned largely with the *Minnesota Multiphasic Personality Inventory* (MMPI) has served to demonstrate clearly that the shortcomings of the old-fashioned inventory were not an inherent defect of the structured approach—and could in fact be avoided by the utilization of psychometrically sophisticated and empirically oriented methodology. As a result, the modern personality inventory has a number of important characteristics:

1. The total pool of questions or statements presented to the subject is large and varied and designed to sample a wide range of areas having clinical, social, or other import with regard to adjustment or personality. (For example, the MMPI contains 550 statements that cover 25 different content areas.) In this sense, the structured test represents an extensive, standardized interview.[1]
2. The development of scoring keys or scales has utilized externally defined criterion groups or measures so that the resulting variables have empirical validation. The variables derived tend to be clinically meaningful and practically useful—they include such measures as symptomatic depression, delinquency proneness, ego strength, and morale.[2]
3. As a corollary of this second point, it has been possible to avoid the controversial argument (and pseudo-issue) of whether the validity of questionnaire data is limited by the validity of self-report. The psychological meaning of a given response to a given item is not inferred from the content of the item plus an assumption of truthfulness on the

[1]Hathaway, S. R., and McKinley, J. C. "A Multiphasic Personality Schedule (Minnesota): I. Construction of the Schedule," *J. Psychol.* 10, 1940, pp. 249-54.

[2]Hathaway, S. R., and McKinley, J. C. "A Multiphasic Personality Schedule (Minnesota): III. The Measurement of Symptomatic Depression," *J. Psychol.* 14, 1942, pp. 73-84.

part of the respondent, but rather from the empirical fact of the frequency with which that response is given in certain externally identified criterion groups of neurotics, recidivists, underachievers, or others.[3]

4. A further characteristic of the modern personality inventory stemming from the empirical approach to item validation and scale construction is the introduction of subtlety. It has been possible to construct and to demonstrate the existence of subtle items, i.e., items the psychological significance of which is not apparent even to sophisticated clinicians.[4] Such items as "It takes a lot of argument to convince some people of the truth" and "I like to flirt" have a response that is reliably more frequent in specific psychiatric diagnoses than in normals. Psychiatrists and psychologists are not reliably successful in identifying which diagnoses such items are associated with nor which is the deviant response. Furthermore, these same experts are not able successfully to falsify "sick" records.[5]
5. Rather than assuming either honesty on the part of the subjects or that the subjects' defenses have been completely circumvented by the subtlety of the items, the empirical method has been applied further to the development of validity indicators, measures that reflect the degree to which distorting attitudes of either a "fake bad" or "fake good" nature were present in the respondent. The nature of a subject's test-taking attitude is in itself a clinically useful datum.
6. Finally, modern tests have developed the use of profiles that show the pattern of personality integration as revealed by the relative magnitude of the subject's scores on a series of scales. These profiles encourage a more intricate approach to both descriptive and predictive analysis of personality in the form of complex configural interpretations, which are considered so basic to projective methods.[6]

Advantages and limitations of using existing tests

The objective features in the mechanics of administration and scoring of these modern personality tests makes them economical and otherwise feasible in the evaluation of large groups, such as the annual pool of applicants to a medical school. Thus, if the number of applicants in a given year to a particular medical school were 300, the interpretation (in the sense of a simple judgment of accept, reject, or questionable) of structured tests would require not more than five hours of a technically skilled and experienced clinician's time. The total cost of the program would not exceed $200.

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[3]Meehl, P. E. "The Dynamics of 'Structured' Personality Tests," *J. clin. Psych.* 1, 1945, pp. 296-303.

[4]Seeman, W. "Concept of 'Subtlety' in Structured Psychiatric and Personality Tests: an Experimental Approach," *J. abnorm. soc. Psychol.* 48, 1953, pp. 239-47.

[5]Gough, H. G., McCloskey, H., and Meehl, P. E. "A Personality Scale for Social Responsibility," *J. abnorm. soc. Psychol.* 47, 1952, pp. 73-80.

[6]Meehl, P. E. "Profile Analysis of the MMPI in Differential Diagnosis," *J. appl. Psychol.* 30, 1946, pp. 517-24.

Furthermore, the standardized characteristics of administration and of scoring and the quantified nature of the test results encourage and facilitate certain important aspects of the applicant-screening procedure and research on that procedure. Some possibilities along this line are mentioned below.

School-by-school, situational validation of the test, its scales, or profiles against a variety of more or less unique criterion variables is facilitated. This point is directly pertinent to the idea that Dr. Funkenstein developed for you, namely that there are differences in the culture, so to speak, of medical schools. The values or biases of selection committees and the criteria for evaluating students are not uniform from school to school. The fact of this diversity relates to the question of the validity of a predictive instrument. Whether it be a projective device or a structured test, when a study demonstrates some level of validity in the predictive accuracy of an instrument used for selection purposes, the technique may be picked up by another school, applied in as closely a parallel fashion as the report of the original study permits, and the results may not be very comparable.

Another possibility is the experimental development of special scales that fit uniquely the selection preferences and criterion variables of a particular school. This is easily accomplished with data from the objective tests we have been considering here. Also the development of precise "rules of interpretation" of test results is encouraged. Practically, this would lessen the admissions committees' dependency on the interiorized expertness of particular clinicians.

Research into the whole selection procedure can be fostered by such activity in individual schools. Increasing precision and objectivity in the operations of administering, scoring, and interpreting such tests and the consequent lessening of the need for services by particular experts make possible truly replicative, crossvalidation studies from school to school.

There are several possible but surmountable limitations involved in the use of existing structured personality tests for the selection of medical students. The content of existing instruments may not sample adequately those personality areas (if such have been reliably demarcated!) that have optimal predictive utility in identifying successful medical students and/or good physicians. It is also possible but not certain that existing personality tests have tended to identify negative personality factors (e.g., neuroticism) that may not be as fruitful in the screening of medical school applicants as would more positively oriented measures of, say, persistence, social welfare motivation, etc. These limitations refer to the existing instruments rather than to the structured approach per se. It may be that we need to develop new structured tests. It is certain that we do need to bolster all use of tests with continuing research and a perpetual awareness that what is valid for one school may not be generally applicable.

Studies with medical students

Only rather recently has there been interest in the potential role of personality study in improving the selection of medical students. In a summary

of research on medical student selection, Michael[7] found only nine studies involving use of structured tests, and eight studies concerned with projectives. Together, these constituted less than one-fourth of her references. Research into the contribution of both projective and objective tests has been scattered, generally not well controlled, usually postdictive rather than predictive, limited to small samples, and lacking in cross-validational checks on the suggestive findings of initial studies.

Two phases of the selection process must be differentiated: (1) the phase of screening out applicants who reveal personality traits bearing poor prognostic implications as regards medical school success, and (2) the phase of identifying from among those who pass the initial screen the applicants who are positively endowed with characteristics significantly related to a high level of performance. In the first instance, a test might be used to screen out for individual and detailed review those applicants giving evidence of serious emotional disturbance, even though they satisfied the intellectual requirements. In the second case, a test might be used to identify among the otherwise acceptable applicants those students whose measures on such dimensions as responsibility, ego integration, persistence, etc., gave particular promise of successful performance. It is important to recognize that the merit of a particular test in satisfying the negative screening-out phase of selection is not necessarily highly related to its value in the positive identification phase.

It is also important to recognize that adequate appraisal of the potential contribution of a personality test to the selection procedure requires that other significant variables be controlled either experimentally or statistically. Thus, a finding that a particular personality test does not differentiate among successful and unsuccessful medical students is not particularly meaningful if the two groups differ significantly with respect to general intellectual aptitude. What we need to uncover is how certain personality variables relate to achievement or failure when the contribution of intellect is either constant or carefully controlled. In this sense it should be appreciated that differentiation of levels of performance within a sample of students, all of whom are continuing in school, is a more critical test of an instrument's potential contribution to the positive phase of selection than is a study of its relationship to a gross pass-fail criterion.

Two studies serve to demonstrate the fact and nature of the contribution that objective personality tests can make to medical student selection, as well as to illustrate significant methodological subtleties. The first of these was a study reported to the Fifty-Sixth Annual Meeting of this Association, held in Pittsburgh in October 1945.[8] Interestingly, this is a study by Carlyle F. Jacobsen, moderator of this symposium. It is one of the first, it is one of the most promising, and in light of the implications that are in it, it raises a very intriguing and disturbing question about what has happened in the last ten years!

[7]Gottheil, E., and Michael, C. M. "Predictor Variables Employed in Research on the Selection of Medical Students," *J. Med. Educ.* 32, 1957, pp. 131-47.

[8]Jacobsen, C. F. "Interest and Attitude as Factors in Achievement in Medical School," *J. Assoc. Amer. Med. Coll.* 21, 1946, pp. 152-59.

The study by Dr. Jacobsen utilized a total of 160 successful medical students comprising the upper 80 per cent of four successive classes and 78 students from these same classes who either stood in the lower fifth of their respective classes or had failed or withdrawn from school. Simple analysis of the distribution of freshman year scores on each of four tests was utilized to assign cutting scores for a straightforward actuarial postdiction of success or failure, student by student, on each test. The measures included the *Medical Aptitude Test,* a composite measure of intellective speed and power together with reading ability, the *Strong Vocational Interest Blank,* and the *Minnesota Personality Scale* (which should not be confused with the MMPI; the MPS yields five scores of "normal" personal and social adjustment and was standardized on high school and college students). Certain intriguing facts emerge from a re-analysis of Jacobsen's data:

1. Of the four measures, the MPS yielded the highest rate of accurate postdiction of the successful students; 93 per cent of this group would have been predicted, using an optimal cutting score.
2. By contrast, this same MPS yielded the smallest rate of accurate identification of the poor group; only 28 per cent of these students would have been identified.
3. There was a sizeable *negative* relationship (rho = —.55) between the accuracy of the four tests in positive identification of the successes and their rate of hits in identifying the failure. (E.g., the Medical Aptitude Test, which was least accurate (80 per cent) in assigning successful students, was second only to the intelligence test in identifying failures (37 per cent).
4. By simple combination of student placements on all four measures, 100 per cent of the successful students were identifiable, but the same composite measure would isolate only 20 per cent of the unsuccessful sample.

It must be understood that, as Dr. Jacobsen phrased it, this was a "study in hindsight." A cross-validational check of the same cutting scores on the same tests in a truly predictive study of new classes would result in some shrinking of these accuracies. What is particularly notable is the relative contributions of the four tests and the great difference in accuracy of the "good" and "bad" placements. This study falls in the first phase of selection, discrimination between successful and unsuccessful students.

Parenthetically, here we have a ten-year-old demonstration of the possibility of identifying, by means of objective tests, a very, very high per cent of successful medical students. As we know from the pre-Institute questionnaire results, as shown in Tables 4.8 and 4.9 (Chapter 4) most medical schools have not used instruments of this type nor do they plan to use them. We are inclined to set the scene in such a way as to imply that we need better tests. We do. However, the immediate problem is to maximize the effective application of instruments we already have.

A study of my own illustrates the application of a structured test to the teasing out of personality dimensions showing relationship to differences in

level of achievement among successful medical students.[9] The post-admission freshman MMPI profiles of an entire class furnished the personality data. Academic achievement was expressed in terms of grades and course credit as the total honor-point ratio (HPR) at the close of the junior year. Freshman scores on the *American Council on Education Psychological Examination for College Freshmen* (ACE) were used to control the intellectual aptitude variable. When upper-quarter students in achievement were contrasted with lower-quarter students with whom they were matched for academic aptitude, it was found that the MMPI scores of the lower-quarter students showed reliably greater deviations along the hysteroid, psychopathic, and schizoid axes, and furthermore that these underachievers were reliably less realistic in their attitudes toward self-appraisal. To check this, students whose personality configurations were characterized by peaks on one or more of these dimensions (even though their scores were generally within the normal range) were matched for scholastic aptitude with students who did not reveal such tendencies, and the two groups were compared as to achievement. The group showing the underachievement components was considerably lower than the control group in mean HPR. This is expressed in the fact that 90 per cent of the students with the hysterical, psychopathic, and/or schizoid dominance in their MMPI profiles fell below the median HPR of their matched controls. Also, with a cutting score set at an HPR of 2.0, one-third of the controls were at this level or higher, although none of the students with the underachiever pattern reached this level.

In short, both of these studies encourage hope that with extended and refined research, it will be found that the objective personality test can make a significant contribution to both phases of the selection of medical students —the screening out of applicants whose character or temperament makes them unlikely to withstand the particular pressures of the rigorous medical school regimen and the identification within the able and healthy of those students whose personality is particularly endowed with characteristics making for a high level of achievement.

The limited studies made to date suggest that individual instruments do not contribute with equal effectiveness to the two ends of the selection process. Obviously, in contrasting instruments and their relative contributions to the two phases of selection, there is an administrative decision required as to whether the "false-positive" or "false-negative" rates constitute the most significant problem with respect to the student, the medical profession, and society.

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[9]Schofield, W. "A Study of Medical Students with the MMPI: III. Personality and Academic Success," *J. appl. Psychol.* 37, 1953, pp. 47-52.

D. The Use of Projective Tests in the Assessment of Medical School Applicants

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IT IS, I BELIEVE, generally agreed that the majority of students who withdraw or are dropped from medical schools do so not because of lack of the necessary intellectual ability but for reasons attributable to other personal characteristics. Low correlations obtained in studies at some schools between *Medical College Admission Test* (MCAT) scores and medical school grades are sufficient evidence of the importance of nonintellectual factors in medical school selection and achievement.

A great variety of devices, ranging from the interview and letters of recommendation to objective and projective tests, have been utilized in an effort to evaluate the personality factors that play such a significant part in achievement. The purpose of the present paper is to assess the contribution projective tests may make to the assessment of the medical school applicant and the medical student.

Projective tests have been so widely used in clinical practice and so frequently discussed in both popular and technical journals that I am going to assume some degree of familiarity with them. However, in order to lay an adequate basis for an understanding of their advantages and limitations and their relationship to other techniques of personality assessment, I should like to review briefly certain aspects of the theory, development, and structure of projective tests.

Historical background

During the 1920's and early 1930's a great deal of criticism of the early tests of personality developed, particularly among clinicians who found them of little or no value in clinical situations. There were several bases for these criticisms. One was the fact that the available tests covered a very restricted range of personality traits and that the traits tested were of limited clinical significance. A second objection was to the ease with which the responses could be deliberately falsified, particularly when the testee had a stake in the outcome of the test.

More fundamental was an objection to the whole "trait approach" to personality description. The tests then in use assumed that personality should be conceived as an aggregation of separate traits. This approach seemed to deny the importance of the organization and integration of personality. Just as physical functions of the organism must be conceived in terms of interrelated and interacting structures and processes, it was argued, the psychological functions of the organism also can be understood not in terms of isolated traits but as an organized and integrated structure. Gestalt psychology with its emphasis on the individual as a whole and psycho-

analysis with its stress on unconscious motivation, defense mechanisms, and ego function were beginning to influence personality theory. This was the atmosphere in which projective tests developed.

Characteristics of projective tests

Projective tests represent an attempt to get behind the mask which the individual presents to the world and to reveal attitudes, feelings, perceptions, motives, and associations of which the subject is unaware or which he might wish to conceal. They represent an attempt to discover the way in which personality is organized to meet needs and to defend against anxieties.

Very briefly, and in very general terms, the rationale of projective tests may be defined somewhat as follows: (1) it may be assumed that behavior is some function of the interaction between the organism and the environment: $B = f[o, e]$; (2) it is reasonable to infer that the more specific are the demands of the environment, the greater the extent to which the resulting behavior is determined by the environment; (3) conversely, the more nonspecific are the environmental demands, then the greater the extent to which the behavior is determined by the individual characteristics of the organism.

For example, if I were to make the specific request that the members of the audience raise their hands, the resulting responses would be primarily determined by the request and would reveal personality differences only to a slight extent. If, on the other hand, I were to put on the screen an inkblot and make the very nonspecific request that you each indicate what the inkblot reminded you of, the resulting responses would be determined to a much greater extent by individual personality characteristics. All projective tests, then, present a stimulus that allows great latitude of response. There are no right or wrong, no conventional answers. The situation requires the individual to reveal his own dispositions. The problem then, of course, is to determine what his responses signify. (To this problem I should like to return after a brief description of the projective tests that have been used most extensively in medical school assessment.)

The Rorschach is the most widely used projective test. It consists of a series of ten plates (cards), on each of which appears an inkblot figure. The figures vary in complexity. Some are chromatic; some achromatic. They are presented one by one and the subject is asked to indicate what each figure looks like to him. Each plate is then presented a second time and the subject is asked to indicate the location of each percept on the figure and to specify what characteristic of the blot (e.g., the form, the shading) determined his percept. His statements are then classified into certain conventional categories. By examination of the relative frequencies of responses in these categories and of the sequence and content of the responses, the examiner constructs a description of the subject's personality. This method of detailed individual analysis is, to a very considerable extent, subjective; it will be referred to here as pattern analysis. Instead of such detailed and subjective interpretation which is usually used in clinical practice, analysis

may be limited to determination of the frequency of responses in various categories. This type of procedure, which will be referred to here as a sign analysis, is reasonably objective but omits a good deal of the information utilized in the pattern analysis.

The time required for administering the Rorschach is approximately an hour. The time required for scoring and interpretation is dependent on the length and complexity of the record and on how detailed a description is desired. The time required may range from a half-hour to two or three hours. The test may be administered in a group form. Among the types of inferences that may be drawn from this test are the following: How conventional or unconventional are the perceptions and associations? Is the thinking systematic and logical or disorganized and autistic? Is the subject inclined to take a comprehensive, abstract point of view toward problems or is his thinking constricted and concrete? How spontaneous and how well controlled are his emotions? How much anxiety does he evidence and how does he react to anxiety?

A second widely used projective test is the *Thematic Apperception Test* (TAT). This too consists in a series of plates but in this case each plate contains a picture of a particular situation. One picture, for example, shows a child seated in a doorway; another shows the silhouette of a figure standing by an open window. The subject is asked to tell a story about each picture. The story he tells, of course, is in part a function of the picture but also in part a function of his own interests, preoccupations, and attitudes. Administration of the test requires from 30-60 minutes. The test was designed to reveal the subject's major motives and the environmental stresses with which he is preoccupied. It may indicate his attitudes toward himself and toward others, significant interpersonal relationships, conflict situations, and the subject's characteristic way of dealing with his problems.

A third commonly used projective test, which is mentioned here because it is currently being used in assessment of medical school applicants, is the *Draw-a-Person Test*. Drawings of the human figure were first utilized systematically as measures of intelligence, but they were also found to show distinctive individual characteristics, and methods of analysis of these characteristics have been developed recently to provide information as to personality. In general it is assumed that in drawing human figures the subject will reveal something of his conception of himself and of his attitudes toward others. For example, does he conceive of himself as dominant, self-sufficient, masculine? Does he conceive of others as inferior, hostile, accusing? The drawings may also be considered to indicate anxiety, conflict, perceptual distortion, and disorganization. Administration of the test requires a brief time, 5 to 15 minutes, and analysis of the drawings can also be completed in a short period of time.

There are many other projective tests but the three described here are those that have been used most extensively in medical school assessment. Now, at this point I'd like to summarize some of the characteristics of so-called projective tests and some of the respects in which they differ from so-called objective tests:

1. Objective tests present the subject with questions or statements which he is (usually) asked to affirm or deny; projective tests present the subject with a variety of tasks that allow almost unlimited latitude of response.
2. Objective tests are structured in the sense that they are designed to measure specified aspects of personality; projective tests are relatively unstructured in the sense that the aspects of personality revealed by the test are inferred from the responses rather than predetermined by the construction of the test.
3. The usual inferences drawn from objective tests are determined by the scores obtained by the subject; on the other hand, the usual inferences drawn from projective tests represent an interpretation by the examiner of quantitative and qualitative data and are consequently subjective to a degree. (However, projective tests may be subjected to a purely quantitative analysis, as in a sign approach to Rorschach interpretation, and objective tests may be analyzed by subjective methods.)

Studies with medical students

The theoretical and technical problems involved in the validation of projective tests are complex. The subject is a highly controversial one, and this paper is not the place for a critical examination of the issues and the evidence. We are concerned here with a more explicit question: What contribution can projective tests make to the assessment of medical school applicants and medical students? Before stating my opinion on this question, I should like to review briefly the studies that have been made or are now in progress.

The earliest report of the use of projective tests in the assessment of medical students is contained in the paper presented by M. R. Harrower-Erickson at the annual meeting of this Association in 1943.[1] She had administered the group Rorschach test to 108 entering students at McGill University in 1941, with results as shown in Table 6.7. These results seemed encouraging. The secretary of the medical faculty is quoted as saying: "The Rorschach provides a better measure of likelihood to succeed than any single academic examination—or personal interview." Dr. Harrower-Erickson, however, felt that the time required for individual examination could hardly be justified on the basis of the results.

In the same paper the use of the multiple-choice Rorschach with Illinois students in 1942 is reported, and the results are shown in Table 6.8. The lower percentage of senior students whose adjustment is rated as questionable is interpreted to mean that those with questionable Rorschachs were poor academic risks and that by the senior year a considerable proportion of students with questionable adjustment had probably dropped out of medical school. However, other assumptions are equally tenable. Waggoner

[1]Harrower-Erickson, M. R. "The Rorschach Test," *J. Ass. Amer. Med. Coll.* 19, 1944, pp. 193-201.

and Ziegler report the result of the study of 148 freshmen medical students at the University of Michigan in 1943, but unfortunately the quantitative data that would be required for any critical evaluation of effectiveness are not supplied.[2] These authors report that there was a ". . . consistent correlation between Rorschach and the psychiatric interview. We believe that a proper correlation of the psychological tests with the Rorschach and the final correlation of these with the psychiatric interview enabled us to make a fairly accurate prognosis of the individual's ability to succeed in medical school."

TABLE 6.7

USE OF GROUP RORSCHACH WITH DETAILED INDIVIDUAL ANALYSIS
(McGill Medical School, 1941)

Personality rating	N	Medical school work of students in personality groups	
		% Satisfactory	% Poor
Excellent, above average, and average	80	86	14
Below average	14	86	14
Poor and very poor	14	7	93

TABLE 6.8

USE OF GROUP RORSCHACH WITH MULTIPLE-CHOICE RESPONSES
(University of Illinois Medical School, 1942)

Group	N	Freshmen and seniors with "questionable" adjustment	
		N	%
Freshmen	168	49	29
Seniors	143	6	4

The next study was conducted at the universities of Illinois and Chicago between the years 1946 and 1950. Group Rorschachs and TATs, together with a large battery of other tests, were administered to two classes of 130 students at one of these schools. There was only a slight relationship between the group Rorschach results and an over-all prediction of success. Concerning this portion of the study, H. W. Brosin concludes, "from the current material, it seems unlikely that these group tests alone or in combination with other tests can provide significant differentiation for success or failure."[3] Results of the analysis of the individual Rorschach tests have not yet been published. Dr. Brosin's preliminary opinion was that: "The individual Rorschach in conjunction with the individual interview by a psychiatrist is by all odds the best method known to us for selection purposes."

In an unpublished paper, Joel Handler, describing the above study in which he participated states, "Our major investment in projective techniques was individual Rorschach experiments. We feel this method has revealed much, not only in terms of aiding in a description of the integration of the total personality, but in making available a description of the type of intelligence, the use of intellectual processes, creativity, intellectual drive, emotional patterns, and their activity in psychopathological processes." He goes on to point out that a surprising amount of psychopathology is revealed by the records but that there is not a very high relationship between psychopathology and medical school achievement. "We have become shatteringly aware that even frank psychosis does not necessarily prevent sufficient mas-

[2]Waggoner, R. W., and Ziegler, T. W. "Psychiatric Factors in Medical Students Who Fail," *Amer. J. Psychiat.* 103, 1946, pp. 369-76.

[3]Brosin, H. W. "Psychiatry Experiments with Selection," *Soc. Serv. Rev.* 22, 1948, pp. 461-8.

tery of test material to put a man in the upper one-third of our classes scholastically."

L. W. Earley, who is currently engaged in a detailed analysis of the Rorschach data obtained in this same study writes: "The use of projective tests is an extremely time-consuming thing. As the situation stands now, by and large, it would be my recommendation that the utilization of these be for selected cases. In and of themselves, they will not predict performance per se. However, they do offer, in my opinion, an extremely good way to study affective make-up and integration of the individuals who take them. Though these are related to the person's performance, it is far from a one-to-one relation."[4]

In 1948 a Rorschach study was done at the University of Oklahoma Medical School in which the upper and lower 15 per cent of the freshman class, on grade-point average, were compared. A sign analysis was used which indicated that these two groups did differ with respect to a number of scoring categories, but the published data give no estimate of the statistical significance of these differences. Dr. Rohrer, who participated in that study, writes: "My own notion about the use of the Rorschach for any status position is that it is of value as an adjunct to psychiatric screening but that it cannot be used as are other psychometric tests in prediction of future success. We have just finished up an interview study of Naval Intelligence officers, and this was our conclusion of the value of the Rorschach with regard to screening them."[5]

A study of 60 senior medical students at Johns Hopkins was reported by Molish, Molish, and Thomas in 1950.[6] In this study, the records of the senior medical students were compared with normative data on other superior groups. The results provide interesting normative data, at least for this school, but are not pertinent to our present interest.

In a study by L. Eron at Yale University, 35 male third-year medical students were compared with 35 male third-year divinity students, and the ten best and ten poorest medical students were compared with one another.[7] No statistical or clinical differences were obtained between the good and poor medical students.

A five-year program is currently in progress at the University of Texas School of Medicine involving the administration of a fairly extensive battery of projective tests to all entering students.[8] Results of this study are not yet available.

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[4]Earley, L. W. Personal communication.

[5]Shoemaker, H. A., and Rohrer, J. "The Relationship Between Success in the Study of Medicine and Certain Psychological and Personal Data," *J. Ass. Amer. Med. Coll.* 23, 1948, pp. 190-201.

[6]Molish, H. B., Molish, E. E., and Thomas, C. B. "A Rorschach Study of a Group of Medical Students." *Psychiat. Quart.* 24, 1950, pp. 744-74.

[7]Eron, L. "The Use of the Rorschach Method in Medical Student Selection," *J. Med. Educ.* 29, 1954, pp. 35-9.

[8]Harrower-Erickson, M. R. "A Psychological Testing Program for Entering Students at the University of Texas School of Medicine (Galveston)," *Texas Rep. Biol. and Med.* 13, 1955, pp. 406-19.

In a very recent article, Hanna Faterson describes the use of the *Draw-a-Person Test* in the screening of medical school applicants at the State University of New York College of Medicine (SUNY).[9] Dr. Faterson has kindly supplied me with additional information, including the most recent report to the Admissions Committee of the Medical School. The test is given to all applicants who are invited for a personal interview.[10] The drawings are inspected briefly by a very experienced examiner who is quite familiar with the requirements for success in this particular school. If inspection of the drawings gives rise to a serious question as to the personality characteristics of the applicant, he is referred for a psychiatric interview and accepted or rejected on the basis of the psychiatric evaluation.

Results for the year 1955-56 are shown in Table 6.9. These results indicate that, of applicants referred for psychiatric interview on the basis of the *Draw-a-Person Test* and not previously rejected on other grounds, 58 per cent are found to be a poor psychiatric risk. In 42 per cent of the cases, the psychiatric interview failed to confirm the impression drawn from the test.

TABLE 6.9

USE OF DRAW-A-PERSON TEST
(SUNY College of Medicine, NYC, 1955-56)

Item	N
Total number of applicants examined	793
Number referred for psychiatric interview	141
Number referred but not receiving psychiatric interview (applications rejected or withdrawn)	103
Number receiving psychiatric interview	38
Admission contra-indicated because of psychiatric risk	22
No definite psychiatric grounds for rejection	16

Conclusions

This, then, is the available evidence on the use of projective tests in medical school assessment. What conclusions, if any, can be drawn from it? The evidence is certainly too meager to permit any definitive statement as to the predictive efficiency of projective tests in the selection of medical students. The Rorschach and TAT are too time-consuming, both in administration and interpretation, and have too limited a predictive validity to warrant their use with all eligible applicants. The *Draw-a-Person Test,* in the hands of an experienced examiner, would appear to be a useful and relatively economical adjunct to the psychiatric interview, but it is not a sufficiently valid predictor to justify basing decisions on the test results alone.

Unfortunately, we have no adequate basis, either, for estimating the predictive efficiency of the psychiatric interview combined with projective

[9]The version of this test used at SUNY involves the drawing of a male and female figure and of an animal, supplemented by verbal descriptions of these figures.

[10]Faterson, Hanna, "The Figure Drawing Test as an Adjunct in the Selection of Medical Students," *J. Med. Educ.* 31, 1956, pp. 323-27.

tests in the selection of medical students. If preliminary screening on the basis of all other available evidence can reduce the cases to be evaluated psychiatrically to a reasonable number, projective tests and psychiatric interviews will probably be worth their cost in terms of professional time. At the moment, however, this conclusion is based more on faith than on evidence.

PART IV

Over-all Appraisal of the Admissions Process

PAGE

Chapter 7. *The Typical Admissions Procedure* 131

Chapter 8. *The Student View of the Medical Admissions Process* 140
by Helen Hofer Gee

Chapter 9. *The Undergraduate College View of the Medical Admissions Process (A Symposium)* 153

A. Effects of Medical School Admissions Policy on the Liberal Arts College 153
by William E. Cadbury, Jr.

B. Some Comments on the Premedical Student Viewpoint 158
by Dorothea S. Miller

C. Needs for Liaison with Undergraduate Colleges 161
by Norman F. Witt

D. The Place of the College in Selection and Preparation for Medicine 164
by R. F. Arragon

E. General Discussion 168

Chapter 10. *The Methods and Goals of Medical Student Selection (A Symposium)* 175

A. Introduction 175
by John L. Caughey, Jr.

B. Over-all Appraisal of the Admissions Process 176
by John G. Darley

C. Multiple Criteria of Medical Education and Their Implications for Selection 185
by E. Lowell Kelly

Introductory Note to Part IV

The admissions process, for the purposes of the Institute, was defined as all the factors that relate to the applicant up to the time of his matriculation as a medical student—his consideration of medicine as a career, his applications to medical schools, and his general orientation to professional education and professional responsibilities. Preceding chapters have called attention to some of these factors. Part IV is concerned with the total process—its methods and its goals.

Evaluation of the admissions process can be considered in two quite separate aspects. The first has to do with appraisal of current procedures in processing applications, the more or less mechanical details of how the schools deal with candidates for admission. The second includes broad consideration of the basic objectives of the admissions process, of the effect of current policies and procedures on recruitment for the profession, and of the characteristics, attitudes, and objectives of the students entering medical school. Both these aspects are considered here in Part IV.

To assure a substantial basis for Institute discussion of current admission practices, each medical school was requested to supply a statement describing its application procedures and samples of the forms used in its dealings with applicants. A summary of this voluminous material comprises the bulk of Chapter 7. This is followed by a presentation of the opinions about current practices of two key groups in the medical admissions process—the applicants themselves and premedical educators. Chapter 8 summarizes the highlights of the pre-Institute survey of entering medical freshmen of 1956, referred to frequently throughout this report. Chapter 9 reproduces the Institute panel by four representatives of undergraduate colleges.

Focus on the objectives of medical student selection, on the deficiencies of current policies, and on possible means for improvement in recruitment for the profession was made possible by the frank and challenging papers of Dr. John G. Darley and Dr. E. Lowell Kelly, which are presented in Sections B and C of Chapter 10. Their emphasis was on the need for clearer definition of objectives, selection of appropriate methods for study of applicants, and objective appraisal of the results by use of meaningful criteria. In Section A of Chapter 10 Dr. John L. Caughey sets the keynote for the two sections that follow it and summarizes the response these papers evoked at the Institute.

CHAPTER 7

The Typical Admissions Procedure

THIS CHAPTER REPRESENTS an analysis of the descriptions of admissions procedures sent in to the Association of American Medical Colleges by 91 medical schools as a part of its survey preceding the Institute.[1] In this analysis, the purpose is to point up some general features typical of most schools' admission procedures, as well as some of the more unusual practices. Consequently words like "usually," "rarely," "almost always," "most," or "some" are used freely. The tables throughout this chapter present more detailed information on current admission practices.

The admission committee

Admission committees are usually composed of not less than four members. As shown in Table 7.1, they typically include representation from the administration, the preclinical faculty, the clinical faculty, and frequently a psychiatrist. In only one instance is an admission committee composed entirely of administrative officers. In another, the admission committee is composed of department heads, but junior faculty members are asked to do much of the spadework. The size of admission committees is roughly related to the size of the school and the number of applicants.

TABLE 7.1

TRAINING AND PRESENT POSITION OF ADMISSION COMMITTEE MEMBERS
(Participants group)

Training and present position	% of 91 schools citing proportion of admission committee members in each training category						
	None	1–10%	11–20%	21–30%	31–40%	41–50%	Over 50%
M.D. clinicians (nonpsychiatrist)	10	1	19	10	27	20	13
M.D. basic science teachers	42	8	30	9	7	2	3
Psychiatrists	52	11	34	2	1	0	0
M.D. administrative officers (deans, directors of admissions, etc.)	31	6	36	13	9	4	1
Non-M.D. basic science teachers	30	4	37	11	9	7	2
Psychologists	94	4	2	0	0	0	0
Non-M.D. administrative officers (deans, directors of admissions, etc.)	59	9	22	4	3	1	2
Premedical advisers	91	0	7	2	0	0	0
Others	91	3	6	0	0	0	0

The authority that admission committees have in general is deciding which applicants will be accepted and which rejected. In most schools this authority seems to be delegated to the committee, but in some schools committee reports go to the dean for implementation. Most committees come to their decisions on the basis of a majority vote. A few committees,

[1]Particular credit goes to Dr. Joseph K. Hill and Dr. Schuyler Kohl, both of the State University of New York College of Medicine at New York City, for their assistance in this project.

TABLE 7.2

EXTENT OF PUBLIC RELATIONS ACTIVITIES IN FOUR TYPES OF MEDICAL SCHOOLS
(Participants group)

Public relations activity	Extent of activity, % of schools with public information officers					Extent of activity, % of schools without public information officers				
	Regular or frequent	Seldom	Only on request	Never	No response	Regular or frequent	Seldom	Only on request	Never	No response
	Schools listing one dean in 1956 AAMC directory (% *based on* $N = 12$)					(% *based on* $N = 21$)				
Visits to premedical colleges by:										
1. Medical school faculty, including administration and admission officers	33	25	42	0	0	29	28	33	5	5
2. Medical students	8	8	8	67	9	5	5	14	52	24
3. Others	0	17	0	8	75	0	0	0	10	90
Visits to medical school by:										
1. Undergraduates from premedical school	50	8	25	8	0	19	34	14	19	14
2. Premedical school faculty	33	50	17	0	0	33	33	10	10	14
Visits by members of the faculty or admissions committee to:										
1. High school groups	8	25	59	8	0	10	9	48	19	14
2. Lay organizations	0	17	58	25	0	14	5	53	14	14
Formal "medical school" day, e.g., "open house" at medical school for:										
1. Teachers	25	8	25	34	8	24	14	0	43	19
2. Students	50	0	17	33	0	24	9	5	43	19
3. Parents	17	8	17	58	0	24	9	0	48	19
Publications, such as leaflets of information for potential applicants, written by:										
1. Your medical students	0	8	0	67	25	0	5	0	67	28
2. Medical school staff	25	17	0	50	8	24	5	5	43	23
3. Public relations counselor or outside agent	8	0	8	67	17	14	0	5	57	24
Films or film strips	0	17	0	58	25	14	5	5	52	24
Reports to undergraduate schools concerning:										
1. Acceptance and/or rejection of applicants	50	8	34	8	0	29	5	33	24	9
2. Progress of their former students in medical school	8	8	67	17	0	19	10	48	14	9
3. Failure of students sent to medical school	17	0	66	17	0	14	5	48	24	9

(Table continued on following page)

TABLE 7.2 (continued)

EXTENT OF PUBLIC RELATIONS ACTIVITIES IN FOUR TYPES OF MEDICAL SCHOOLS
(Participants group)

Public relations activity	Extent of activity, % of schools with public information officers					Extent of activity, % of schools without public information officers				
	Regular or frequent	Seldom	Only on request	Never	No response	Regular or frequent	Seldom	Only on request	Never	No response
	Schools listing dean and assistant deans in 1956 AAMC directory (% *based on* $N = 25$)					(% *based on* $N = 33$)				
Visits to premedical colleges by:										
1. Medical school faculty, including administration and admission officers	40	20	40	0	0	36	21	37	6	0
2. Medical students	12	24	16	40	8	6	30	18	37	9
3. Others	0	0	0	8	92	0	9	3	6	82
Visits to medical school by:										
1. Undergraduates from premedical school	52	24	20	4	0	61	18	21	0	0
2. Premedical school faculty	40	48	8	4	0	36	43	15	3	3
Visits by members of the faculty or admissions committee to:										
1. High school groups	8	28	36	28	0	9	18	64	9	0
2. Lay organizations	8	36	40	16	0	9	6	61	21	3
Formal "medical school" day, e.g. "open house" at medical school for:										
1. Teachers	32	12	12	40	4	18	15	12	55	0
2. Students	40	4	16	40	0	21	12	12	55	0
3. Parents	24	8	12	48	8	15	9	12	58	6
Publications, such as leaflets of information for potential applicants, written by:										
1. Your medical students	0	8	0	84	8	0	0	3	88	9
2. Medical school staff	32	16	4	36	12	24	15	12	49	0
3. Public relations counselor or outside agent	12	16	0	68	4	3	9	0	82	6
Films or film strips	4	8	4	76	8	3	12	6	73	6
Reports to undergraduate schools concerning:										
1. Acceptance and/or rejection of applicants	36	12	44	8	0	36	9	37	15	3
2. Progress of their former students in medical school	28	16	52	4	0	21	12	55	9	3
3. Failure of students sent to medical school	24	16	52	8	0	21	9	37	30	3

however, attempt to get unanimous decisions, and one school authorizes an individual committee member to commit a place in the class should he find a promising candidate on his visit to undergraduate schools.

The tenure of committee members is variable, but the term of appointment is almost always for more than one year and includes some provision for overlapping membership. Usually, committee members are appointed by the dean. In one instance, however, committee members are elected by the faculty and appointed by the university board of regents on the advice of the dean and the president of the university.

In carrying on their work, some committee members have developed special functions. For example, the admission committee of one school assigns a geographical area of the United States to each committee member who makes it a point to become as familiar as possible with that area and with undergraduate schools in it. Other schools have certain designated members of their committees who carry on the functions of preliminary screening. Some committees call on their psychiatrist members for special psychiatric interviews.

Practically all committees (96 per cent) find it profitable to review the progress of the previous year's class before getting down to the work of admitting another class. One school has instituted what it terms a "death conference," in which failures and withdrawals are studied very carefully, in an effort to improve the admissions techniques for the future.

It should be noted that at least one school goes to the trouble of sending back to the undergraduate college complete performance reports for its graduates at the end of the first year of medical school. The feeling is that this procedure helps the undergraduate school in making its recommendations and, further, greatly improves rapport with the undergraduate school.

It is a rather common feature to circulate the applicant's records among the members of the admission committee prior to the meetings so they may be studied in some detail. In many instances records are summarized on a single sheet, and frequently lists of applicants, together with the major facts concerning them, are provided for the committee's use. Most admission

TABLE 7.3

OPINION ON STANDARDIZATION OR CENTRAL CLEARANCE OF SOME ASPECTS OF THE ADMISSIONS PROCESS
(Participants group)

Opinion on increasing standardization	% of 91 participants
Favorable	27
Unfavorable	71
No response	2

TABLE 7.4

METHODS FOR DECIDING WHICH APPLICANTS ARE INTERVIEWED
(Participants group; multiple response)

Method for selecting interviewee	% of 91 participants
All of the most promising applicants are interviewed routinely	74
Only candidates who present special problems but who are otherwise being seriously considered for admission, are interviewed	6
All candidates who request interviews are interviewed	44
Only candidates who request interviews are interviewed	2
Every candidate who eventually is offered a place in the entering class is interviewed	60
Participants who did not check *any* of the above methods	2
Other	13

committees meet weekly during the peak period of their work.

There seems to be a definite trend among admission committees toward making visits to undergraduate schools. Such visits are used to talk with prospective applicants, to build up rapport with the undergraduate school, and to familiarize committee members with the school. (See Table 7.2.)

Processing of applications

Most items on the application form are the same for the majority of the schools studied, as can be seen in Table 4.4, Chapter 4. Variations are minor and in most instances of a local character. One major deviation from the usual form was found in a school which asks the applicant for a budget showing how he proposes to finance his medical education. In replying to their questionnaire, the Institute participants group voted strongly against any standardization of the admissions process. (See Table 7.3). In discussion at the Institute there was small support for any uniformity in application forms, distribution of applications, or timing of acceptances. On the other hand, most participants favored the present "traffic rules" and urged that they be followed by all schools (See Table A.1, Appendix A).

Most schools will provide an application form for anyone requesting it. However, schools that regularly enroll large proportions of students from their own states tend to discourage application from outside of their areas. In 1956, 80 per cent of the United States medical schools reported an application fee requirement; fees ranged from $2.00 to $10.00 but were usually $5.00. For three of the schools the application fee applied only to nonresidents.

In routine processing of applications, it is quite general for nonprofessional people to do the preliminary checking. This is true in almost all cases. In many universities where the medical schools are on the university campus, it is the university registrar's office or the university director of admission's office that is responsible for the preliminary processing for completeness of routine requirements.

In practically all schools receiving 500 applications or more per year, a preliminary qualitative screening is carried out before the detailed work of the committee begins. In most instances, this is done by the chairman of the committee. Sometimes, as mentioned above, it is performed by individual committee members. Rarely is this phase of screening done by the dean or university director of admission. In almost no instance is a nonprofessional person used for this purpose.

The bases for the preliminary qualitative screening are usually the academic average (Table 3.3, Chapter 3), the *Medical College Admission Test* (MCAT) scores (Table 3.7 in Chapter 3), and the place of residence. To a varying extent, letters of recommendation, age, mental or physical health, and admission to another school are used as criteria in the preliminary screening. Rigid standards in these latter categories are rarely set; their application is usually left to the discretion of the screeners. Almost invariably,

before rejection letters are sent, the names and records of the rejectees are presented to the committee for the approval of this action. (School policies on various factors influencing candidate selection are shown in Appendix A, Table A.8.)

In regard to physical examination, the general rule is to require a health report from the student's own physician. Usually, such a report is required only of students who are invited to the interview. One school uses the *Cornell Medical Index* in connection with its health report.

The interview

Most schools use the interview as an integral part of the admissions process (see Chapter 5). Usually, the preliminary screening of applications results in a determination of who shall be invited to the interview, rather than who shall be considered for admission. In some instances, the question of who shall be interviewed is decided by the committee. However, it is the opinion of most of the schools that the delegation of this responsibility to a "preliminary screener" is satisfactory. Table 7.4 shows that 74 per cent of the schools interview all the most promising candidates routinely.

Interviews are usually conducted with one person interviewing one candidate. Usually, however, the candidate participates in more than one interview. A few schools are experimenting with group interviews—three or four students at a time. In one instance, the entire committee as a group interviews each candidate. The necessity of going to some length to put the candidate at ease in this latter situation is emphasized. Various interview methods used are shown in Table 7.5. (For a discussion of student attitudes toward the interview, see Chapter 8.)

Tables 7.6 and 7.7 show that interviews are usually conducted by members of the committee. In some instances, faculty members other than members of the committee are used as interviewers. In one school nonfaculty members and even nonmedical personnel are used in a group interview situation. This group might include clergymen or laymen from the community. In several institutions, medical students participate in the applicant interview. One school posts an informal list of applicants so that students may come around to meet them. In another school a formal list is posted scheduling students to meet with applicants. Applicants

TABLE 7.5

INTERVIEW METHODS USED
(Participants group)

Interview method	% of 91 participants
One student with one interviewer	59
One student with two or more interviewers simultaneously	20
Two or more students with two or more interviewers simultaneously	4
Combination of two or more of the above methods	14
No response	2

TABLE 7.6

INTERVIEW ARRANGEMENTS
(Participants group; multiple response)

Item on interview arrangements	% of 91 participants
All or most of the interviews occur at the medical school	86
Regional representatives conduct interviews in different parts of the country	37
All of the interviews are conducted by members of the medical school teaching staff either on or off campus	41
Most of the interviews are conducted by members of the admissions committee	78
Other arrangements commonly used	7
Did not check *any* of the above statements	3

TABLE 7.7

BACKGROUND AND TRAINING OF INTERVIEWERS
(Participants group)

Background and training	% of 91 schools citing proportion of interviewing staff in each training category					
	None	1–20%	21–40%	41–60%	61–80%	81–100%
Members of the admissions committee	2	14	8	8	11	57
Physicians	15	1	8	14	34	28
Full-time clinical faculty members (M.D.)	18	18	27	25	9	3
Voluntary or part-time clinical faculty members (M.D.)	55	23	15	6	1	0
Psychiatrists	47	50	2	1	0	0
Clinical psychologists	90	9	1	0	0	0
Basic science teachers in the medical school	16	24	36	19	2	3
Other	72	20	6	2	0	0

TABLE 7.8

LENGTH OF APPLICANT INTERVIEW
(Participants group)

Length of interview	% of 91 schools citing:		
	Less than 50% of interviews this length	More than 50% of interviews this length	No response
Less than 15 minutes	90	3	7
Approximately 15 minutes	72	21	7
Approximately 30 minutes	48	46	6
Over 30 minutes	87	10	3

to still another school participate in get-togethers with students and visits to the building and classes. In one school the applicant's spouse is interviewed. In most instances interviews are conducted during the academic year. Generally interviews last from 15 to 45 minutes (see Table 7.8). Tables A.17 to A.30, Appendix A, give more data on the interview.

Although many purposes are attributed to the interview, as can be seen in Table 4.13 in Chapter 4, the vast majority of interviews seem to be held simply for the purpose of getting to know the applicant better. In some cases the interview is reserved specifically to verify information provided on the application blank and no attempt is made to go beyond this.

Many schools have a standard report form used in connection with the interview, and an interview rating sometimes becomes part of an over-all "score" used in the evaluation of the candidate. In this connection a few of the medical colleges are experimenting with some formulas for an over-all applicant rating that summarizes a variety of factors. Some of these are quite elaborate, and one school goes so far as to assign weights to specific undergraduate courses. Another school gives special consideration to the academic performance record attained late in the applicant's collegiate career. In evaluating the undergraduate academic record, the admission committees seem to take cognizance of variation in the quality of undergraduate instruction as well as variation in grading practices. Some schools have developed formal methods of evaluating the level of undergraduate education.

Summary

In analyzing the individual school descriptions of their admissions procedures, one is struck by the degree of similarity in general procedure found among the medical schools. The pattern finds the prospective medical student filing his application, together with transcripts of credit, MCAT scores, letters of recommendation, and health reports. Upon receipt, this material is screened by clerical workers for completeness and for routine requirements. A professional person, usually the committee chairman, picks out the applications that appear promising and invites the applicant to be interviewed.

After one or two interviews, usually with members of the committee, a written record is circulated and the committee, in a weekly meeting, makes a majority decision to accept, reject, or table each application.

TABLE 7.9

STARTING AND CLOSING DATES FOR APPLICATION BLANKS*
(Participants group)

Announced closing date for receipt of applications	% of schools citing dates application blanks first distributed				% of schools citing closing dates
	Before June 30, 1956	July 1—Aug. 31, 1956	Sept. 1—Oct. 31, 1956	No response	
	U. S. medical schools (N =84)				
Before Oct. 31, 1956	5	4	0	0	9
Nov. 1—Dec. 31, 1956	10	14	5	0	29
Jan. 1—Feb. 28, 1957	14	11	7	1	33
March 1—April 30, 1957	3	6	4	0	13
After April 30, 1957	1	1	0	0	2
No fixed date	4	8	1	0	13
No response	1	0	0	0	1
Total % distributing blanks	38	44	17	1	100
	Canadian and other medical schools (N =7)				
Before Oct. 31, 1956	14	0	0		14
Nov. 1—Dec. 31, 1956	14	0	0		14
Jan. 1—Feb. 28, 1957	0	0	0		0
March 1—April 30, 1957	0	14	0		14
After April 30, 1957	15	0	14		29
No fixed date	0	0	29		29
Total % distributing blanks	43	14	43		100

TABLE 7.10

EARLIEST ACCEPTANCE DATES IN RELATION TO NUMBER OF APPLICATIONS PROCESSED*
(Participants group)

Earliest date for final acceptances	% of schools citing earliest dates according to number of applications processed			Total % of schools citing earliest dates
	250 or Less	251–1000	Over 1000	
		U. S. medical schools (N =84)		
Prior to Aug. 31, 1956	0	2	2	4
Sept. 1—Oct. 31, 1956	7	30	25	62
Nov. 1—Dec. 31, 1956	7	15	3	25
After Jan. 1, 1957	3	6	0	9
Total % processing applications	17	53	30	100
		Canadian and other medical schools (N =7)		
Nov. 1—Dec. 31, 1956	0	0	14	14
After Jan. 1, 1957	57	29	0	86
Total % processing applications	57	29	14	100

*For entrance to fall 1957 medical freshman classes.

After the meetings, acceptances are offered and rejectees notified. As the class becomes filled, an alternate list is established. Some detail on filing dates and acceptance dates is given in Tables 7.9 and 7.10.

Noteworthy among the unusual practices are those of conducting special psychiatric interviews, reviewing the progress of the previous year's class, reporting the progress of students back to the undergraduate schools, the use of the *Cornell Medical Index* in connection with the health report, the group interview, the participation of medical students and laymen in the interviewing process, the inclusion of an interview rating in an over-all index, and attempts to rate the undergraduate schools.

It is clear that some experimentation is under way that is calculated to improve the accuracy of the selection process (Appendix C). Furthermore, it was evident throughout the Institute discussions that the primary concern of the participants was not the improvement of isolated operational detail, but rather the identification of criteria by which the over-all goals of admissions policy may be evaluated.

CHAPTER 8

The Student View of the Medical Admissions Process

BY HELEN HOFER GEE

Director of Research, Association of American Medical Colleges

EARLY IN THE programming stages of the Institute, the Planning Committee faced the problem of how best to bring the focal point of the admissions operations—the student himself—into the proceedings. Surely the student should be given a hearing, should have the opportunity to express his views on the admissions procedures to which he is subjected as an applicant to medical school, but how could a representative expression of student opinion be obtained? Facilities would not permit inviting student representatives from all medical schools in the country, and in any case the students so selected would in all probability be representative, not of the majority of successful applicants, but of clearly outstanding students, and for them admissions procedures may well present different types of problems from those faced by the less well-endowed majority. Then, how many students would feel free in the Institute setting to express their views frankly? How many would become inarticulate, or mouth platitudes in accordance with what they perceived to be socially acceptable? Considerations like these led to rejection of the idea of inviting students to be present at the Institute. Instead, a pre-Institute questionnaire survey was chosen as a method of gaining access to the student view of the admissions process.

Purpose of the survey

Considerations of time, funds, and accessibility led to the selection of the entering freshman medical class of fall 1956 as the group to be surveyed by means of a mail questionnaire. It was believed that, for these students, the experience of applying for entrance to medical school was sufficiently fresh to promise recall with some degree of accuracy, and that at the same time ephemeral traumatic reactions to the experience would have had time to subside. Further, it was felt that by administering the questionnaire prior to, or at least within the first few days of attendance at medical school, "contamination" of an applicant's opinion by his new experience of functioning as a medical student might be minimized. Of course we do not know the effects on attitudes of such a complex of feelings as apprehension over what lies ahead, exhilaration at reaching the turnpike leading to a career in medicine, and self-satisfaction with having attained the status of membership in a highly select group. Surely this is a generally euphoric state, and not one that is likely to be conducive to negatively biased attitudes toward the experiences immediately preceding it—quite the contrary.

Although favorableness of the climate of student opinion toward the admissions process is of interest, assessing it was not the principal objective of the survey, nor even a major one. The real purposes of the pre-Institute survey were: (1) to gain some insight into the student's perception of various pressures and influences to which, as a medical school applicant, he is purported to be subject; (2) to obtain data that would permit individual medical schools to compare attitudes toward their own admissions procedures with attitudes toward procedures followed at other schools; and (3) to obtain general information about the backgrounds of the present-day medical student.

This pre-Institute survey, like those in past years, is not intended to stand as an exhaustive research enterprise. Time requirements force rapid construction of questionnaires with a minimum of pretesting. In this case assurance of anonymity was the only control used to encourage accuracy of response. The Institute surveys are intended to raise questions, to serve as points of departure for Institute discussions, and to provide the stimulus for more intensive studies of apparent circumstances. The results of the survey of 1956 Institute participants and the survey of admissions committee members appear in every chapter of this book. This chapter is devoted to highlights from the analysis of the questionnaire administered to 1956 medical freshmen.[1]

Administration of the questionnaire

Questionnaires were administered to approximately 7,600 freshman medical students at the opening of school in the fall of 1956. These students represent 84 of the 85 United States medical schools (returns from the 85th school were received too late to be included in the analysis). Response was excellent; 100 per cent returns were obtained from the majority of schools, and even the lowest return was 87 per cent. In order to permit completion of data analysis within the month intervening between data collection and the Institute, a 10 per cent random sample of the first-year class in each of 84 medical schools was drawn for the analysis.[2]

The questionnaire was constructed by Dr. John L. Caughey, Jr., with the assistance of the Planning Committee and members of the Association's research staff. It was designed to be self-administering. For most students there was assurance of complete anonymity of response in that questionnaires were not to be signed, but signatures were requested of the students at 28 of the schools because their participation in another simultaneous research project necessitated the identification of individuals.

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[1] Copies of the complete data analysis may be obtained from the Office of the Director of Research, Association of American Medical Colleges, 2530 Ridge Avenue, Evanston, Illinois.

[2] During the year following the Institute, confidential individual reports were prepared for each medical school. Response percentages for the entire freshman medical class of 1956 were thus made available. Almost all percentages based on the 90 per cent sample deviated by less than 2 per cent from those obtained from the 10 per cent random sample on which the discussion in this chapter is based.

However, these students at the so-called *test* schools were told their names would not be revealed and, like students at the *nontest* schools, they were assured practical anonymity by the device of self-sealed envelopes for their completed questionnaires. Comparison of responses of students from both types of schools are discussed later in this chapter.

Background of the medical freshman

Tabular results shown in Tables 8.1 to 8.5 indicate that the freshman medical students tend to come from rather small, well-educated families living in urban communities at a fairly high socioeconomic level. Three-fourths of them have two or fewer siblings (Table 8.1), and about 39 per cent are oldest children (Table 8.2). Half of their parents have had at least some college experience (Table 8.3), and well over half of the fathers are employed at professional and managerial occupational levels (Table 8.4). Although medicine and medically related fields are the occupations of only 14 per cent of the fathers, this percentage is half of the total whose backgrounds are professional. The occupation most frequently listed for the fathers of the 1956 freshman medical class was that of proprietor, listed by 17 per cent of the total class. The hometown of 51 per cent of the class is a large city (over 100,000 population) or its suburb, and for another 18 per cent it is a smaller city (10,000 to 100,000 population), as shown in Table 8.5.

As an undergraduate college student the typical medical freshman majored in a biological or physical science (see Table 8.6 and the discussion of pressures and influences below). Somewhat less than a third of them had

TABLE 8.1

NUMBER OF SIBLINGS
(Medical freshmen group)

Number of siblings	% of 271 freshmen*
None	14
One	36
Two	25
Three	13
Four or more	11
No response	1

TABLE 8.2

POSITION AMONG SIBLINGS
(Medical freshmen group)

Position among siblings	% of 271 freshmen*
Oldest	39
Neither youngest nor oldest	20
Youngest	26
Only child	14
No response	1

TABLE 8.3

EDUCATION OF PARENTS
(Medical freshmen group)

Extent of parents' education	Fathers of freshmen		Mothers of freshmen*	
	N	Per cent	N	Per cent
Professional—advanced degree(s)	194	26	17	6
Four-year college graduate	88	11	54	20
1—3 years of college	117	15	59	22
High school graduate	112	15	74	27
10—11 years of school	83	11	25	9
7—9 years of school	89	12	27	10
Under 7 years of school	52	7	10	4
No response	21	3	5	2
Total medical freshmen	(756)	100	(271)	100

*The questions tabulated in Tables 8.1, 8.2, and 8.3 were asked only of the students participating in another research project, the test-school respondents.

TABLE 8.4

FATHERS' OCCUPATIONS
(Medical freshmen group)

Occupation of father		% of 756 freshmen
Professional		28
Medical	11	
Dental	2	
Related to medical (e.g., Veterinary)	1	
College professor	1	
Teacher, below college level	3	
Clergy	3	
Lawyer	3	
Engineer	3	
Other professional	1	
Semi-professional and technical		3
Farm owner and farm manager		4
Manager, official, proprietor		30
Proprietor	17	
Manager	8	
Official	5	
Clerical		2
Sales		7
Craftsman		5
Foreman		2
Operative		4
Laborer		2
Service worker		2
Farm laborer		*
Other		6
Deceased and not elsewhere classified		2
Retired		*
Unemployed		*
No response		3

*Less than 1 per cent response.

TABLE 8.5

SIZE OF HOME TOWNS
(Medical freshmen group)

Size of home town	% of 271 freshmen*
A large city (over 100,000 pop.)	39
The suburbs of a large city	12
A small city (10,000 to 100,000 pop.)	18
A town (1,000 to 10,000 pop.)	16
A small town (under 1,000 pop.)	4
The country, but family received income from work in town	1
The country, family owned the ranch or farm it operated	7
The country, on rented or tenant farm or ranch	†
The country, but family received income from nonfarm sources	1
No response	2

*This question was asked only of the students participating in another research project, the test-school respondents.

†Less than 1 per cent response.

attended the parent university of their medical school, about one-third a different college within the state, and another third an out-of-state college (Table 8.7). Very few (4 per cent) 1956 medical freshmen admit to having participated in no extracurricular activities at all as undergraduates, most of them claiming participation in one to five different activities. About half had held offices in student organizations, and a quarter had been titular "heads" of organizations (see Table A.31, Appendix A).

Table 8.8 shows the kinds of activities premedical students tend to enter. Most popular during their undergraduate years are special-interest clubs, athletics, and social fraternities. A fifth of these students participate in student government activities—an impressive proportion, if true. Data like these must obviously be viewed with scepticism, inasmuch as "participation" is not rigorously defined and may be claimed with only a minimum of actual involvement. Membership in social fraternities is more characteristic of medical students than is election to honorary or professional fraternities;

TABLE 8.6

UNDERGRADUATE MAJORS
(Medical freshmen group)

Undergraduate major	% of 756 freshmen
Biological Science	29
Chemistry	25
Premedical	14
Zoology	12
Other	5
Humanities	4
Psychology	4
Social Sciences except psychology	3
Physical Sciences except chemistry	2
Mathematics	1
No response	1

TABLE 8.7

LOCATION OF PREMEDICAL COLLEGE
(Medical freshmen group)

College location compared to medical school	% of 756 freshmen
Same institution	28
Same state	34
Different state	36
No response	2

but, for both the social and intellectual pursuits such membership represents, the proportions are high compared with university students in general.

TABLE 8.8

UNDERGRADUATE EXTRACURRICULAR ACTIVITIES

(Medical freshmen group; multiple response)

Undergraduate activity	% of 756 freshmen
Special interest group—e.g., science, language clubs	53
Athletics—varsity or intramural	43
Social fraternity	38
Honorary and professional fraternities—e. g., Alpha Epsilon Delta, Phi Beta Kappa	20
Student government	20
Religious organization	16
Music—e.g., band, choir, orchestra	15
Journalism	14
Job	6
Other	20
No response	8

TABLE 8.9

NUMBER OF MEDICAL SCHOOLS APPLIED TO BY 1956 MEDICAL FRESHMEN

(Medical freshmen group)

Number of schools applied to	% of 756 freshmen
One	22
Two	14
Three	18
Four	11
Five	11
Six	6
Seven	4
Eight	3
Nine	2
Ten	3
Eleven	1
Twelve	1
Thirteen	1
Fourteen or more	2
No response	1

Pressures and influences on the applicant

Students were asked to supply information on the history of their application for admission to medical school. The typical accepted student, by his own report, applied to from 1 to 5 different schools and was accepted by his first-choice school (Tables 8.9 and 8.10). Forty per cent of these successful applicants were offered places in more than one medical school (Table 8.11), but some felt that circumstances forced them to accept a place in a school that was not their first choice. Table 8.12 reveals that 15 per cent of the 1956 medical freshmen felt so compelled, and the early acceptance dates reported by some students (Tables 8.13 and 8.14) may contribute toward an explanation of this circumstance. In some cases students indicated that a binding commitment was required by a second-choice school before a favored school had acted on their application. In other cases fear that the favored school would not offer an acceptance led to early acceptance of another offer.

What does the student perceive to be the important factors influencing his choice of a medical school? Table 8.15 shows that the "general reputation" of the school was by far the most important factor for practically all students, with geographic location and contacts with medical students next most important. Geographic location as a decision factor may be related to

TABLE 8.10

PREFERENCE RANK OF MEDICAL SCHOOL NOW ATTENDING

(Medical freshmen group)

Rating of present school in relation to others	% of 756 freshmen
First choice	70
Second choice	20
Third choice	5
Fourth choice	3
Fifth choice or lower	1
No response	1

TABLE 8.11

NUMBER OF MEDICAL SCHOOL ACCEPTANCES RECEIVED

(Medical freshmen group)

Number of acceptances	% of 756 freshmen
One	60
Two	27
Three	10
Four	2
Five or more	1

TABLE 8.12

STUDENT OPINION ON BEING COMPELLED TO ACCEPT LOWER THAN FIRST CHOICE MEDICAL SCHOOL

(Medical freshmen group; multiple response)

Reasons for feeling compelled to accept secondary choice	Frequency*
Conflicting dates of notification by medical schools. Had to make a binding commitment at another school before hearing from first choice	27
Fear of not being accepted by first choice	26
Had such a strong desire to be admitted that first offer was accepted	22
Ranked first and second choice schools almost equal, so it made little difference	13
Accepted second choice school, then withdrew when admitted to first choice	9
Almost accepted second choice, but heard from first before commitment was due	6
Rejected by first choice, so accepted second	3
Miscellaneous	11

*Number of times reason cited by 112 respondents feeling compelled to accept secondary choice; 605 freshmen did not feel so compelled, and 39 did not respond.

TABLE 8.13

STUDENT REPORTS ON DATE OF FIRST ACCEPTANCE

(Medical freshmen group)

Date of first acceptance to 1956 medical class	% of 756 freshmen
Before January 1955	1
January—July 1955	3
August 1955	1
September 1955	2
October 1955	12
November 1955	18
December 1955	20
January 1956	13
February 1956	9
March 1956	8
April 1956	4
May 1956	2
June 1956	2
July 1956	2
August 1956	1
September 1956	1
No response	1

the residence restrictions of some tax-supported schools, particularly in the case of a student with financial problems or one whose academic ability and achievement records are marginal. The effect of personal contact with other students in choosing a medical school suggests the importance of the grapevine. Unfortunately the survey shed no light on what was meant by a medical school's "general reputation" or how it is communicated. More than two-thirds of the students felt, however, that they had satisfactory bases for rating their choice of a medical school (Table 8.16).

Although 84 out of 85 United States medical schools claim that the medical applicants' undergraduate major field is not a primary issue in the selection of applicants, many premedical students feel pressured into selection of a major other than the one in which they are most interested. More than a fourth of the 1956 medical freshmen yielded to such pressures, and most of them reported they did so following the advice of undergraduate college advisers (Table 8.17).

Almost a third of the students took courses beyond stated medical school requirements for the express purpose of increasing their chances for admission to medical school (Table 8.18), and many admitted that this was also the primary motivation behind selection of a major. Many admissions com-

TABLE 8.14

STUDENT REPORTS ON REQUIRED DATES FOR BINDING COMMITMENTS

(Medical freshmen group)

Committal date	% of 756 freshmen
Before January 1, 1956	16
January 1—January 21, 1956	24
January 22, 1956, and after	25
Yes*	15
No*	12
Response uninterpretable*	3
No response	5

*The precise meaning of these responses is not clear.

TABLE 8.15

INFLUENCING FACTORS IN SELECTION OF A MEDICAL SCHOOL
(Medical freshmen group)

Influencing factor	% of 756 freshmen citing importance of factor				
	Much	Some	Little or none	Not considered	No response
General reputation of school	70	27	2	0	1
Geographic location	46	28	14	11	1
Contacts with medical students	37	45	14	3	1
Estimated cost, tuition, etc.	31	27	24	17	1
Advice of premedical adviser	23	36	24	16	1
Study of school catalogs	18	43	27	11	1
Advice of home-town physician	16	27	25	31	1
Study of "Admission Requirements of American Medical Colleges"	16	35	23	25	1
Advice of parents	15	30	34	20	1
Advice of medical school alumni	15	27	26	31	1
Other	7	3	0	1	89

TABLE 8.16

STUDENT SATISFACTION WITH BASIS FOR SELECTION OF A MEDICAL SCHOOL
(Medical freshmen group)

Response on school selection	% of 756 freshmen
Satisfactory basis	68
Not a satisfactory basis	31
No response	1

TABLE 8.17

INFLUENCING FACTORS IN SELECTION OF A LESS PREFERRED UNDERGRADUATE MAJOR
(Medical freshmen group)

Reason for selection of a less preferred major	% of 201 freshmen citing importance of reason*				
	Much	Some	Little or none	Not considered	No response
Advice of college adviser	33	32	13	17	5
Thought it would enhance chances of getting into medical school	27	18	20	28	7
Advice of "major professor"	18	27	26	22	7
Advice of a medical school	17	26	23	27	7
Advice of friends in medical school	9	26	22	38	5
Advice of parents	3	13	33	46	5
Advice of family doctor	2	7	26	60	5
Other	27	17	0	1	55

*Of the 756 medical freshmen, this 27 per cent did not major in their field of greatest interest; 71 per cent did, and 2 per cent did not respond to the question.

mittees would concede that, other things being equal (e.g., ability measures, grade averages, etc.), they would lean toward selection of the student who had "demonstrated" an interest in the natural sciences in selection of a major field. We do not know whether such selection is defensible or not. Common sense rather than results of specific studies suggests that, given equal marginal ability, emphasis on the natural sciences provides the better preparation for medical education and that interest in premedical science course work would be characteristic of the more promising future physician. Definition of an acceptable lower limit of ability for the study and practice of medicine and knowledge of performance correlates of interest and personality characteristics are required before questions like these can be answered satisfactorily. Solutions can be approached only through research, however, not by means of conjecture.

TABLE 8.18

UNREQUIRED UNDERGRADUATE COURSES TAKEN TO AID ADMISSION TO MEDICAL SCHOOL
(Medical freshmen group)

Number of courses taken to aid admission	% of 756 freshmen
None	70
One	10
Two	10
Three or more	10

Student Attitudes Toward the Admissions Process

Effect of the admissions procedure on attitudes

Students find the application procedures of the school to which they finally are admitted quite satisfactory (Table 8.19). Only 4 per cent indicated that their attitudes had been unfavorably affected. In contrast, 42 per cent were unfavorably impressed with the procedures at one or more of the other medical schools to which they had applied (Table 8.20). Looked at another way, however, it should be pointed out that of all schools listed by all students, only 23 per cent of the ratings of procedures were unfavorable. Confidential reports issued to individual medical schools in the spring of 1957 have enabled each school to compare the frequency of favorable and unfavorable reports of its procedures with national totals.

TABLE 8.19

STUDENT OPINION OF APPLICATION PROCEDURES OF MEDICAL SCHOOL NOW ATTENDING
(Medical freshmen group)

Attitude toward school due to its procedures	% of 756 freshmen
Very favorable	46
Favorable	36
No effect	14
Unfavorable	4

TABLE 8.20

STUDENT OPINION OF APPLICATION PROCEDURES OF OTHER MEDICAL SCHOOLS APPLIED TO
(Medical freshmen group)

Impression of other schools	% of schools rated by 756 freshmen	% of 756 freshmen
Very favorable	19	36
Favorable	28	48
No effect	30	32
Unfavorable	23	42
No response	—	21

A variety of relationships were investigated between taxonomic breakdowns and attitudes toward the admissions procedures of the medical school each student entered. Chi-square tests of significance were applied, and two of the tested relationships were found to be significant:

1. Students in the schools participating in another research project (the so-called test schools referred to earlier) were more favorably disposed toward the admissions procedures in their schools than were students in the nontest schools (Table 8.21). Inasmuch as an interest and personality test battery was administered to most of the test-school students immediately before they filled out the questionnaires, the effect of this experience is confounded with the possible effect that signing their questionnaires may have had on these respondents. A result obtained elsewhere in the survey is of interest here. Nearly 60 per cent of all freshmen expressed favorable or enthusiastic attitudes toward the

TABLE 8.21

PARTICIPATION IN AAMC TESTING PROGRAM VS. EFFECT OF APPLICATION PROCEDURES ON ATTITUDE

(Medical freshmen group)

Group	N	% of freshmen in 2 groups citing attitude toward medical school due to procedures			
		Very favorable	Favorable	No effect	Unfavorable
Test school	(271)	54	33	10	3
Nontest school	(485)	42	38	16	4
Total	(756)	46	36	14	4
			$\chi^2 = 12.2472$	$p < .001$	

use of psychological tests as part of the admissions procedure, another 30 per cent expressed indifference, and only 11 per cent were opposed (see Table 8.25). This outcome negates an earlier held hypothesis to the effect that subjection to the tests in the AAMC research program would result in a higher incidence of unfavorable attitudes among test-school respondents. It appears instead that inclusion in the research project may have had a positive effect on attitudes. We can only conjecture about whether the greater enthusiasm expressed by test-school respondents can be attributed to incomplete faith (conscious or unconscious) in the assurance of anonymity or to "generosity set" induced by participation in a large-scale research project.

2. Students from the parent university of their medical schools are slightly more conservative in their expression of opinion about admission procedures than are students whose undergraduate years were spent at other colleges in either the same or a different state (Table 8.22). Their attitudes are neither as highly favorable nor as inclined to be unfavorable as are the attitudes of the students to whom the environment of the medical school is less familiar.

Several other possible relationships to attitude were tested: number of medical schools applied to, number of schools at which interviews were received, regional location of the medical school, relative preference rank of the school attended, aspect of application procedures believed least well handled, having taken tests as a part of the admissions procedure, and self-estimates of anxiety level as compared with other medical school applicants. None of these was found to be significantly related to the effect of the

TABLE 8.22

LOCATION OF PREMEDICAL COLLEGE VS. EFFECT OF APPLICATION PROCEDURES ON ATTITUDE

(Medical freshmen group)

College location compared to medical school	N	% of freshmen in 4 college location groups citing attitude toward medical school due to procedures			
		Very favorable	Favorable	No effect	Unfavorable
Same institution	(215)	38	43	17	2
Same state	(260)	49	36	10	5
Different state	(270)	49	32	14	5
No response	(11)	64	27	9	0
Total	(756)	46	36	14	4
		$\chi^2 = 14.5275$	$.05 > p > .02$		

school's procedures on the student's attitude toward his school.

The interview

Chapter 5 of this book is devoted exclusively to a symposium on the interview, and the use of this selection tool in the medical admissions process is discussed in Chapter 4, "Appraising Nonintellectual Characteristics." It was pointed out there that student opinions of the interview received some attention at the Institute round tables. In the pre-Institute survey students were asked to indicate what aspect of the admissions procedure they felt was least well handled by medical schools in general. One-quarter of the students named the interview (see Table 4.11, Chapter 4). Another quarter declined to answer or indicated they had no complaints. Except for delay in notification of acceptance or rejection, which was singled out by 13 per cent of students, other complaints were scattered.

Although *poor* ratings were assigned to 15 per cent of the total number of ratings made by students of specific interview experiences, and *excellent* ratings given 41 per cent of the time (Table 8.23), the fact that fully one-fourth of the freshman medical student population rated at least one interview as poor suggests strongly that this aspect of the admissions procedure should be subjected to close scrutiny. Especially is this true in view of the gross incompatibility that exists between the extent to which the interview is utilized as part of the selection procedure and its demonstrated inutility as a tool for the prediction of performance (see Chapter 5, Section D). Of 17 classes of comments detailing reasons for the assignment of *poor* ratings to interviews, 8 reflected upon the attitudes and skills of interviewers (see Table 4.12, Chapter 4).

Only 25 per cent of medical schools make extensive use of psychiatric interviews (see Table 4.9, Chapter 4), and few students were certain they had been interviewed by a psychiatrist during the application process (see Table A.33, Appendix A). Nevertheless, most students are favorably disposed toward the use of the psychiatric interview as a regular part of the admissions procedure (Table 8.24). In general, it appears that students have faith in the ability of the psychiatrist to make appropriate judgments based upon interview contact (see Table A.34, Appendix A). One might speculate about whether this generally favorable attitude would persist if psychiatric interviews were used more extensively than they are at present. In any case, the way is open to test hypotheses suggested by students' comments.

TABLE 8.23

STUDENT RATING OF INTERVIEWS EXPERIENCED
(Medical freshmen group)

Impression of interview	% of interviews rated by 756 freshmen	% of 756 freshmen
Excellent	41	63
Good	26	42
Satisfactory	17	28
Poor	15	25
No response	—	9

Use of psychological tests

Psychological tests other than the MCAT were administered to approximately one-fifth of the 1956 medical freshman class (see Table A.35, Appendix A). Results of such tests are, however, utilized to an even lesser extent in assessing applicants than are interviews by psychiatrists (see Table 4.9, Chapter 4). As in the case of the psychiatric interview, few students expressed opposition to the use of tests as a regular part of the admissions procedure (Table 8.25). And again it is pertinent to speculate about the effect that more extensive use would have upon student attitudes. Medical freshmen make the same kinds of positive statements about tests as they make about psychiatric interviews—statements implying a readiness to accept these techniques as selection tools.

TABLE 8.24

STUDENT OPINION OF PSYCHIATRIC INTERVIEW AS REGULAR PART OF ADMISSIONS PROCEDURE
(Medical freshmen group)

Opinion of psychiatric interview	% of 756 freshmen
Enthusiastic	15
Favorable	49
Indifferent	24
Opposed	10
Strongly opposed	1
No response	1

TABLE 8.25

STUDENT OPINION ON USE OF PSYCHOLOGICAL TESTS AS REGULAR PART OF ADMISSIONS PROCEDURE
(Medical freshmen group)

Opinion of psychological tests	% of 756 freshmen
Enthusiastic	11
Favorable	47
Indifferent	30
Opposed	10
Strongly opposed	1
No response	1

Other gripes and anxieties

A fairly substantial proportion of the first-year medical students felt that the business of applying for entrance to medical school had interfered to some extent with their undergraduate college performance during the preceding year (Table 8.26). Regardless of the amount of interference claimed by the students, they all agreed in asserting that the primary sources of difficulty were the anxiety felt over gaining acceptance, the time spent in traveling to and from interviews, and the time spent filling out application forms. As would be expected, students who applied to many different schools, and those who rated themselves as more anxious than other students, were most inclined to feel their performance was affected by the application procedures. Only 18 per cent of all students felt they suffered less anxiety than the average applicant to medical school, and 27 per cent felt they suffered more (Table 8.27).

TABLE 8.26

STUDENT OPINION ON INTERFERENCE WITH PREMEDICAL PERFORMANCE CAUSED BY ADMISSIONS PROBLEMS
(Medical freshmen group)

Extent of interference	% of 756 freshmen
Much	4
Some	16
Little	20
Not at all	59
No response	1

TABLE 8.27

STUDENT SELF-RATINGS OF ANXIETY AS COMPARED WITH THAT OF OTHER APPLICANTS
(Medical freshmen group)

Self-rating of anxiety	% of 756 freshmen
Much more anxious	7
More anxious	20
Average	55
Less anxious	18

Location of medical school relative to the undergraduate college, number of applications filed, aspect of the admissions procedure rated least well handled—none of these were found to be related to self-estimates of anxiety level. Geographical region of the medical school, however, was found to be related. Students in Southern schools have a greater tendency than others to consider themselves as more anxious than average (see Table A.36, Appendix A). Reports that only a small proportion of students can gain acceptance to medical schools (Table 8.28) appear to be the primary source of anxiety. Note in this connection that students from Southern states actually enjoy more favorable ratio of applications to acceptances than do students from other regions. Low grades and the attitudes of fellow premedical students, as well as reports from students already in medical school, are other significant contributors to the applicant's subjective state.

TABLE 8.28

STUDENT OPINION ON FACTORS CAUSING ANXIETY
(Medical freshmen group)

Factor causing anxiety	% of 756 freshmen rating importance of factor				
	Much	Some	Little or none	Not considered	No response
Reports that only a small proportion of applicants are accepted	30	43	17	9	1
Over-all low grade average	11	23	31	34	1
Low grades in science courses	9	16	36	38	1
Attitude of other premeds	7	33	32	27	1
Reports from students in medical school	6	30	37	26	1
Anxiety of parents	6	21	36	36	1
Lack of participation in extracurricular activities	3	17	34	44	2
Discouraging attitude of instructor(s)	3	10	31	54	2
Having a nonscience major	2	5	18	73	2
Other	11	9	1	0	79

Competition among premedical students, along with other factors, may discourage some good prospects from persevering through the undergraduate curriculum to application to medical school. Slightly more than half of the freshman medical students know well-qualified people who had switched to another field, chiefly for the following reasons: competition, length of medical school program, inadequate financial resources, and poor grades

TABLE 8.29

FACTORS INFLUENCING OTHER STUDENTS WHO SWITCHED FROM MEDICINE
(Medical freshmen group)

Influencing factor	% of 398 freshmen citing importance of factor*				
	Much	Some	Little	None	No response
Competitiveness of premed students	29	28	20	18	5
Medical school is too long	29	28	17	20	6
Inadequate financial resources	23	35	16	21	5
Poor grade average in freshman year	22	26	15	29	8
One poor grade in a required subject	21	25	17	29	8
Premedical curriculum imposed too many time limitations on outside activities	15	24	23	29	9
Lack of understanding in possible careers in medicine	13	25	27	26	9
Discouraging attitude of instructors	13	24	24	29	10
Premedical curriculum was not intellectually stimulating	12	20	22	35	11
Alleged declining prestige of the medical profession	1	6	13	71	9
Other	13	7	0	1	79

*Of the 756 medical freshmen, this 53 per cent said they had known students who were good prospects for medicine but switched to another field; 45 per cent said they did not know such students, and 2 per cent did not respond.

(Table 8.29). These complaints are well known to both medical and premedical educators. The problem of the length of the medical curriculum is the subject of continued study and experiment in medical education. Student finances receive much attention and new sources of scholarship funds are continually sought. The problems of competitiveness and of undergraduate college grades are more difficult in not being amenable to direct attack. The cost of the education of a physician is too great to permit medical schools to relax admission standards at the risk of increased numbers of failures following admission—a practice that would give more would-be physicians the opportunity to try. As for the possibility that some good prospects are lost to medicine through fear that their grade averages will not measure up, the only presently available solution lies in increasing dissemination of accurate information about actual requirements.

Conclusion

By their free-response comments about the problems presented by medical school admissions procedures (see Table A.37, Appendix A), and by inference through their responses to specific questions, first-year medical students seem to feel greater concern about the validity of selection techniques than about any other aspect of the admissions procedure. As is evident throughout the chapters of this book, student concern is shared by the admissions committees whose responsibility it is to make the decisions.

In general, the student who has been admitted is inclined to be favorably disposed to the selection process, a fact that simply serves to emphasize those aspects of the process toward which a critical attitude is apparent. Study of the data provided here can offer admissions committees many clues to ways in which the selection process may be made less onerous to applicants, but it would be desirable if the opinions of unsuccessful as well as of successful candidates could be made available for consideration. Some reflection of the rejected applicant's views will be evident in the observations of premedical advisers presented in the next chapter.

A matter to which particular attention should perhaps be directed is the description of the typical medical freshman, for it is apparent that medicine is drawing its talent from a narrow segment of society. The implications of this fact are relevant in considering the far-reaching challenges presented by the two symposium speakers in Chapter 10.

CHAPTER 9 A Symposium

The Undergraduate College View of the Medical Admissions Process

AT THE INSTITUTE the most vigorous attack on present medical school application procedures came from the premedical educators who had been invited to present the undergraduate college point of view. They emphasized the present burden on college teachers and on premedical student advisers and the great stress to which some candidates for medical school are being subjected. The college representatives made many specific suggestions on ways in which applications and decisions about them might be modified to ameliorate these conditions.

On the other hand, the medical school representatives showed less than expected concern over procedural details. This should not be attributed to complacency about existing procedures. A more likely explanation is that Institute participants recognized the great diversity of individual school problems and realized that a myopic focus on procedures would be unproductive until more general agreement on broad policy and objectives had been obtained.

It is clear that the premedical educators were not insensitive to the problems of the medical schools, and their criticisms were not narrowly conceived, for their concern was primarily with the impact of procedures on the student and on premedical education as a whole.

One evening during the Institute was devoted exclusively to spokesmen for the undergraduate point of view, and that panel discussion is reproduced in this chapter. Panel chairman, Dr. William E. Cadbury, Jr., Dean of Haverford College and coauthor of the Severinghaus Committee report on *Preparation for Medical Education in the Liberal Arts College*, sets the keynote in Section A for the three papers that follow. The discussion following panel presentation is reported verbatim in Section E.

A. Effects of Medical School Admissions Policy on the Liberal Arts College

BY WILLIAM E. CADBURY, JR.
Dean, Haverford College

IT WAS A GREAT privilege to be invited to the Institute, to act as moderator for this panel, and to have the opportunity to talk to a group of medical educators—people who are directly involved in this process with which we in the undergraduate colleges are deeply concerned. The aim in choosing this panel was to get a cross-section of the kinds of educators in American liberal

arts colleges who would be able to make significant contributions to the discussion.

The members of our panel are Dr. Dorothea S. Miller, Assistant Dean of Students, Division of Biological Sciences, The University of Chicago, a biologist by training; Dr. Norman F. Witt, Chairman of the Chemistry Department, University of Colorado, premedical adviser from way back and treasurer of Alpha Epsilon Delta, the national honorary premedical fraternity; and Dr. R. F. Arragon of Reed College, an historian by profession and one who is rapidly approaching that mythical stature of being elder statesman of liberal arts education in this country.

There is, of course, a great temptation for people like us to be carping critics of medical schools and to criticize your various individual actions. We are going to try to avoid the isolated instances except where they seem to be particularly significant, and I am not sure just how many sins the members of the panel are going to list. You have already had a pretty rough time, it seems to me; you have been damned for your interview techniques and what use you make of the interview; you have been damned for the kind of people you let into medical school and the kind of students you graduate from the medical school. I do think it has been a little unfair since I suspect that, to the best of your ability, you let in the best of those that we supply for you.

The view that we are going to take is to a very considerable extent a point of view that was specifically omitted from the pre-Institute questionnaire material. (There wasn't much omitted in that questionnaire, I must say! Incidentally, before I get into the more serious part of it, I was rather interested to note in Table 4.4, Chapter 4, which lists those questions medical school admissions forms ask, that 31 per cent of the forms asked whether the applicant had any children and only 17 per cent cared whether or not he was married. I refuse to make any interpretation of that particular piece of information.)

Table 9.1 deals with the seriousness of current admissions problems. If you look at that table you can see that among the current admissions problems cited by Institute participants there is some concern with the weaknesses of undergraduate colleges but no indication whatever of any concern for the effect that admissions policies may have on the liberal arts colleges. It is this point we want to keep in the foreground of our discussion, because your policies do have a very considerable effect on the liberal arts college. Obviously your policies have an effect on those people who are admitted to medical school, and these make up a fairly large proportion of the population of colleges like my own. They also have an effect on the education of those other people, of whom the number is fairly substantial, who have at one time or another in their college career the intention of applying to medical school. Then, less directly but nonetheless really, your policies have an effect on the whole ethos of the institution.

It is quite understandable that you would be primarily concerned with the quality of the people who come to medical school. This is as it should be, but if you have policies that are disrupting to the education of the young

TABLE 9.1

OPINIONS ON SERIOUSNESS OF CURRENT ADMISSIONS PROBLEMS
(Participants group)

Problem	% of 91 participants citing seriousness of problem			
	Little or no problem	Moderate problem	Serious problem	No response
A. Recruitment of potential candidates	41	43	15	1
B. Relations with undergraduate colleges:				
1. Understanding of medical education purposes or content on part of undergraduate faculty or advisers	25	53	21	1
2. Understanding of medical education purposes or content on part of undergraduate college students	15	55	29	1
3. Adequate evaluation of premedical students by premedical college	14	59	24	3
4. Other relations	1	1	1	97
C. Design of application blank or other form	86	12	1	1
D. Text of form letters to candidates	92	8	0	0
E. Clerical processing of applications for review by admissions officer(s)	66	25	9	0
F. "Mechanical problems" of filing and handling:				
1. Current application materials	85	10	5	0
2. Stored, noncurrent materials	78	12	8	2
G. Choice of tests for use in admissions	42	46	10	2
H. Interviewing process	60	22	9	9
I. Interpretation of MCAT in admissions	51	37	8	4
J. Interpretation of other tests	64	3	3	30
K. Need for local research study of outcomes of present admissions process (e.g., predictive efficiency of selection devices or cost efficiency of overall selection process)	21	55	22	2
L. Need for research study on a cooperative school or national basis	30	39	21	10

people in our care, this is a matter of great concern to us. It should be a matter of concern to you in the medical schools also, even from the more narrow point of view you might quite understandably be expected to have, because the quality of the people you get, as influenced by the educational environment in which they have been, is going to be depreciated by any detrimental factors influencing that environment.

I do want to mention one example of an admissions policy that is detrimental to education in the liberal arts college, and that is your "driblet" method of sending out acceptances. The effect of this driblet method of sending out acceptances is that many students are in an emotional turmoil from the first of October until sometime late in the spring. They are running to the mailbox at each mail to see if the coveted letter has arrived, and if it does not arrive they continue in this state of anxiety for a long, long time.

I know that many of you feel it would be extremely difficult to work out any other system and it would be disrupting to your well-being, but let me assure you that the present system is extremely disrupting to the well-being of a very large number of undergraduate students in their senior year. If you want your students to receive the best kind of education, it would be a great service to yourselves as well as to the colleges if you could in some way devise a scheme that would remove this period of continued anxiety. Now, I am not saying that you should enter into an early admissions policy rather than a late one. I don't care when the acceptances come, but if they could come within a reasonably brief period of time, then this period of tremendous anxiety would be shortened by just that much.

There is another matter of admissions policies which may in the future have a tremendous impact on the colleges, and this is the sort of thing

exemplified by the study Northwestern is starting on the possibility of integrating liberal arts education with medical school education. This, I think, is a step that deserves the most careful consideration and might become an extraordinarily valuable development. If and when it comes, it is going to have a profound influence on the policies of the undergraduate colleges—even more profound on the small colleges not connected with any medical school, like Haverford, than on the large institution that has the liberal arts college and medical school in the same university.

I note that the people at Northwestern have no intention of jumping into this experiment without thinking very seriously about all of its implications. I do not mean to imply that I oppose this kind of step. I do hope that many of you will think deeply about the possibilities in this connection, but I also hope that as you do think about it you will think about the effect it will have on the educational process in the colleges from which you draw your students.

Incidentally, a number of years ago Dr. James B. Conant, then president of Harvard, made a suggestion that is not so very far from this idea—a suggestion that some students be assured of acceptance by medical schools at the end of the freshman year, and that there be some teaching of medical school subjects before the student actually enters medical school. This suggestion fell into a pool of deep silence, and the echo from it seems only now to be coming back.

TABLE 9.2

DESIRE FOR INFORMATION ON NONACCEPTED APPLICANTS
(Participants group)

Response	% of 91 participants
Yes	77
No	21
No response	2

Another matter I would like to mention briefly refers to Table 9.2, where 77 per cent of the participants indicated it might be wise to have a follow-up on students who had been rejected by medical schools. I think this follow-up would be of considerable value to many of you, particularly in connection with those students rejected by your medical school and accepted by some other medical school. I also think a study of what has happened to those students who have applied to medical school and not been accepted by any is a study well worth making and actually quite long overdue. I think it is well worth making for a number of reasons. For one thing, I think that if such a study were made, you would probably find that some of those you rejected had made great successes in one or another kind of life. The question then would arise whether those people were the kind of people who might well have made a similar success had they been admitted to medical school.

Think of a purely hypothetical case of a student who is rejected by all medical schools and then gets a Nobel prize for research in biology.

Although it is unlikely that such an extreme case would turn up, I think it is almost certain that you would find large numbers of the people who had been rejected who were successful in one field of endeavor or another. This might well give you further insight into your admissions policies, if you could study the reasons for his rejection in the first place. If the study were made carefully enough you might be able to discover some of the factors that contributed to his success but were hidden at the time the rejection occurred.

From our point of view in the liberal arts colleges information of this sort would be valuable for a number of reasons, one of the most important of which would be in our function as counselors. When a boy comes to me at the end of his senior year and points out what I know already, that he hasn't yet received an admission to medical school, he is pretty distressed and feels his life is now over. It would be very valuable to people like me if we could point out to him that we know there are large numbers of people who went through an experience like his and who subsequently led happy and successful lives. This is assuming that medical school rejectees do in fairly large proportions lead happy and successful lives; it is something we would have to find out about. If we had specific information, it would be helpful to us in our role as counselors of these young people.

Alan Gregg made a suggestion at the Lake Placid meeting in 1950—and I am not advocating this, I am simply suggesting that this is something that might be thought about—he made the suggestion that it might be wise for the medical schools to lean more heavily on the colleges in the actual admissions process. He pointed out cases in Europe where one educational institution made the selection for the succeeding institution, rather than the higher institution in the system making the selection from the lower. None of our colleges that have selective admissions policies allow the high schools to select their students. None of the medical schools allow the colleges to select their students. But I just wonder if maybe Alan Gregg's suggestion doesn't have the germ of an idea in it that might be worth thinking about. Perhaps the undergraduate colleges which do know their boys better might be able to do a helpful job if they were given some actual responsibility in the selection, instead of merely being asked for recommendations as at present.

These are just some ideas I toss out for you to think about by way of introduction to the sections that follow.

B. Some Comments on the Premedical Student Viewpoint

BY DOROTHEA S. MILLER
Assistant Dean of Students, Division of Biological Sciences
The University of Chicago

THERE IS, AS I don't need to tell you, a great deal of anxiety and tension among premedical students, and I will add my testimony to that of Dean Cadbury that this is a somewhat painful phenomenon. In every college the degree of tension is a result of how large the premedical population may be. If they are in considerable numbers, the stressful period when they are striving for admission to medical school is one that is very full of anxiety, not only for the candidates but also for their friends, for their advisers, for anybody who will stand still and listen.

From the standpoint of the medical school, perhaps this period of tension does have its useful factor because I believe the ability to withstand the admissions process is a very good test of emotional stability. From the standpoint of the liberal arts colleges, anything that can be done to reduce the degree of anxiety is a service to the students and, in fact, to the whole college.

Several improvements have been made in recent years. One of these is the early acceptance of medical students. This at least shortens the period of anxiety, for which we are all thankful. In Table 7.10, Chapter 7, I was struck by the datum that 66 per cent of the schools do issue final acceptances as early as October 31, almost a year ahead. According to the student questionnaire, more than 5 per cent of the 1956 freshmen surveyed were actually accepted before October 1, 1955 (see Table 8.13, Chapter 8). This is a step forward, I think, and if Kansas and other medical schools accept entering college freshmen into the medical class there will be a larger proportion. So at least 5 per cent were accepted, essentially before school opened in the fall. This is something of a boon. Then another 50 per cent were accepted by January 1, which means, on our campus, by the end of the autumn quarter. If we can survive the autumn quarter successfully, life becomes somewhat more peaceful. I think that in fairness we should face the fact that this is, of course, not done as a service to the liberal arts college! Early acceptance is without doubt a product of the fact that there is competition among medical schools for the best candidates, so they want to get in their bids earlier and earlier—but here what is an advantage to the medical schools is also a blessing to the college.

A second step that has been a tremendous advantage is the January 15 deadline for acceptance committal by the candidates (see Table 9.3). This, obviously, permits considered judgment in a relaxed atmosphere of a decision that is extremely important to the student. The matter of those who do not abide by this agreement has been kicked around to a certain extent in the round tables today. I was startled to notice the extent to which the schools don't seem to abide by the agreement; in Table 8.14, Chapter 8, we are told than 16 per cent of the medical freshmen had to make a decision before January 1.

TABLE 9.3

REQUIRED COMMITTAL DATE FOR APPLICANTS
(Participants group)

Applicants' committal date	% of 84 U.S. Schools
Less than 2 weeks after acceptance is issued	7
Two to 4 weeks after acceptance is issued	40
By January 15	42
Other	10
No response	1

I believe that this jumping the gun does the medical school itself a disservice in the long run. Premedical students know everything, and part of what they know is even true. The premedical grapevine is prodigious, and students know very well about the January 15 deadline. When some students have the experience of having a medical school force them into an early decision, this is not good for the reputation of the school, and I think it is quite natural that this medical school loses stature in the minds of the students. Medical schools are regarded with something like awe, and it might be well to consider whether it is worth while to injure this esteem by failing to play the game according to the rules.

Another change that has been a great help is the early report of rejections. I think this is getting much more common—to replace the cruel business of an applicant's waiting until school opens to see whether he is in the medical class, and if not then he has been rejected. In many medical schools, as soon as a decision is made, the applicant is so informed. This reduction of the period of uncertainty is a kindness. Even an unwelcome certainty is better than wondering.

Now from our point of view as premedical advisers, there are several things about the admissions process that could be improved, and these aren't all too easy to solve. The first one, I think, is rather easy. It would be advantageous to have even more and clearer statements of medical school requirements. The AAMC book of admissions requirements[1] has been one of the great boons to premedical students and advisers. Having all this information in hand cuts down the manhours involved in our job, and it is even more important from the standpoint of the students. They don't need to wonder or inquire about a lot of things, but can refer to the book and find out.

However, the statements of requirements are not entirely clear for all schools. For many schools they are, but the matter of "recommended" courses particularly causes a good deal of concern. There is always the question of how strong is a recommendation. If a course is recommended, does this really mean that it is required or you won't have a chance in the school? Clarification on this point would be helpful not only to students but also to advisers planning academic programs. There is a good deal of

[1] *Admission Requirements of American Medical Colleges* (Evanston, Illinois: Association of American Medical Colleges), revised annually, $2.00.

suspicion that the applicant may not get a fair deal in the admissions process, and if "hidden requirements" are suspected, this is not wholesome.

I would like to make another suggestion, but fear that this is a hot potato. It would be most helpful if there could be clearer reports of the reasons for rejections. Some medical schools, I believe, do this as well as they can. It is not an easy problem, but partly as a result of the fearful and wonderful premedical grapevine, there is a widespread fatalistic feeling that no matter how good the student is or how good a citizen, some mysterious factor may come along and trip him up. One of the real causes of anxiety is that occasionally, for some undefined reason, an apparently good candidate (at least good in the eyes of his peers) does not make the grade. Then excitement runs rampant, and assorted stories as to the imagined reason for his rejection circulate through the group. Such stories are often handed down from year to year, confusing each generation of applicants concerning the real bases of acceptance and rejection.

If it would be feasible to make it more clear to the rejected candidate why he was not successful, it would make for a more wholesome atmosphere. If the word gets around that students are rejected for reasonable cause, some of the mystery and dread surrounding the admissions process would be removed. Even unsuccessful applicants would rather know the reasons than be left to speculate.

Another thing that could be improved—and this has had a play already during the conference—is the stress on grades, real or imagined. Premedical students certainly feel that the grade average is the most important single factor considered by admissions committees. This belief helps foster the so-called "greasy grind," who strikes something of a sour note on every campus. He is not loved by his colleagues, and not all premedical students are in this mold, thanks be! At the lower end of the scale, the need for decent grades is obviously important. From our point of view this is a good thing too, because it helps weed out the unfit, and in fact helps them weed themselves out. If a student encounters the premedical science courses, for instance, and finds that he has neither taste nor talent for them, it usually isn't necessary to go to great lengths to persuade him that medicine probably is not the right field. A minimum grade level, then, is a serviceable thing.

However in the middle and upper ranges, grades assume too great an importance. In the eyes of many premedical students, the difference between an A-minus and a B-plus is earth-shattering. There have been reports that on some campuses, students go to rather extreme lengths to assure that somebody else gets the B-plus and he gets the A-minus. I hope that such cases are isolated. However it is all too common for instructors to be pestered by students for a few extra points on tests, or to be pressured for a higher grade to permit them to get into medical school.

The word on what medical schools want does filter back to the colleges, and rather soon. For instance, the fact that the medical schools really want more liberal training is fairly generally accepted, after some initial skepticism. In the same way, if the medical schools really are willing to ac-

cept good citizens with substantial but not brilliant grades, this information would reach the colleges fairly quickly, and it would help the colleges maintain an atmosphere in which there is more genuine interest in learning rather than in grade-point averages. Maybe this is hoping for the millennium. The present stress on grades certainly is encouraging, if not forcing, premedical students into a materialistic mold which, as Dr. Kelly indicates (see Chapter 10), may continue into medical school and on into the practice of medicine.

C. Needs for Liaison with Undergraduate Colleges

BY NORMAN F. WITT
Chairman, Department of Chemistry
University of Colorado

THIS HAS BEEN a very interesting conference, a stimulating and exciting experience, I am sure, for all of us in the preprofessional education field. I am going to use the term "pre" even though there are those of us who feel that premedical is a misnomer, because we feel that what is called premedical education is as much part of the total education of the physician as many of the other things that he gets later on. So we simply use the term "pre" to express something that must precede.

Now what do we mean by education? Education has been defined by Sir Richard Livingston to be something that should prepare us, either by a general or a vocational training, to earn our bread. It should give us some understanding of the universe and man and it should help us to become fully developed human beings. I think that probably the part about the breadwinner will not be neglected, but the last two aims, those of making intelligent individuals and of making good human beings, are sometimes neglected.

I have seen a statement of liberal education as proposed to the commission on liberal education of this Association some time ago which reads as follows:

"Men and women are liberally educated to the degree that they are literate and articulate in verbal discourse in the language of the artist and in the symbolic language of science, informed concerning their social and spiritual environment and concerning their relationship thereto as individuals, sensitive to all the values that endow life with meaning and significance, able to understand the present in the perspective of the past and the future and to decide and act as reasonable moral beings."

Now I think if we could qualify all of our premedical students in those terms, we would have little difficulty in getting them accepted into medical school, and probably they would turn out to be the kinds of physicians that we wished them to be.

Dr. Aura E. Severinghaus of Columbia once described, and very well I

think, what we should expect of a boy or girl in college. These are his words: "Through the disciplines he should find an introduction into the cultural inheritance whereby he becomes familiar with the best that has been taught and said and done in the world. Through contact with devoted and inspiring persons in the college community, he should become henceforth a different person himself."

Whether we realize it or not, medical education and medical admission procedures have a great impact upon premedical education and premedical educators and vice versa. I think that many of the medical educators who are not directly connected with admissions committees have very little idea as to the impact of this process upon premedical educators and premedical education. I think the reverse can be said—that in the colleges of arts and sciences the premedical educators have little or no information as to the effect of preprofessional education upon medical education. This suggests there is a real need for an exchange of ideas.

There are several important problems that have been reported in the pre-Institute research findings and I should like to cover just a few of these. One was that 27 per cent of the students in the freshman class took majors they did not like and which many of them took largely to satisfy their premedical advisers (see Table 8.17, Chapter 8). Now why was this true? Well, I am going to generalize a little bit and say that at least some premedical advisers are probably empire-builders. In other words, they are trying to build up the number of students in their particular courses. Some of the premedical advisers are not well informed, they have not kept themselves informed as to what the medical schools desire. I think a very important factor to consider is that this job of premedical advising in many instances has been wished upon these individuals by their institutions as something additional to what they are already doing. We find that in many instances there is no recognition given for this service by the university for which they are working. The premedical adviser may be an assistant professor or associate professor. All of you connected with an educational institution know there are things that are considered for promotion, and if this kind of important service is not recognized, then one is apt to slight it because he feels it is not going to get him very far.

The premedical adviser must have a definite interest in students. He must also have a definite interest in education, and he must be willing to take the time to do the job properly. The Association of American Medical Colleges has done much to help universities and colleges of arts and sciences to recognize premedical advising as an important service. The Buck Hill Falls meeting a number of years ago had quite a long discussion on the value of the premedical adviser to the institution and the need for recognition of this fact by the deans and the presidents of the universities. Given such recognition, the adviser might have his teaching load cut down so that he would have more time to do the job—many times he does not have adequate time to see students. Another important thing, he should have some expense allowance, so that he might attend conferences, visit medical schools, and become a better informed individual as to what is desired by the respective

medical schools. This is important to the university, it is important to the medical school, and most of all it is most important to the student.

We have talked about liberal education on numerous occasions and I think one thing that we have to remember is that we don't swing the pendulum too far to the other side. In other words, we should have a balance between the sciences and the "liberal" education. The sciences can be taught so as to be liberal education courses and could be of much value in this respect. The student should be allowed to choose his own major. I suspect that medical schools do not want every student to have a bachelor's degree with a major in the humanities or a major in English literature or a major in history. More likely what they want is that the student have the opportunity to take the courses in the areas in which he is interested. In other words, if he is interested in sciences and after he has taken what we consider to be those courses that will give him at least an insight into liberal education, he should be allowed to take the courses of his choice without any interference from the premedical educators.

I understand students sometimes say that after acceptance to the medical school they can take various courses they couldn't take before because they didn't dare take them, because their advisers didn't want them to, or because taking them might influence acceptance to medical school. I think that is unfortunate; of course the student should have the opportunity and the privilege to take any courses he might want to take, after he has satisfied the minimum requirements.

Another thing that was mentioned, we have a large number of students who enter the universities as premedical students and then change their minds as they go on into the sophomore and junior and senior years. Why is this true? Here again I am going to generalize that many of them drop the premedical course as their own choice. They do not find what they expected to find, and they realize they are not really suited for medicine. Some of them have gotten away from family pressure and have decided to change their major. Some of them have changed their major because of good advice by their premedical educators.

Before closing I want to mention one idea that is being carried out and that really helps the undergraduate college—many medical schools are inviting the premedical educators to visit their campuses and to go over their admissions procedures; they meet with the admissions committees, the deans, and various other people connected with the admission of students and talk back and forth on the various problems. This helps to create a good mutual understanding.

Now, we are making progress and we are growing in what we are trying to do. If I were to leave a thought here, I would say that we should keep on doing and keep on growing because we do by doing and grow by growing.

D. The Place of the College in Selection and Preparation for Medicine

BY R. F. ARRAGON
Professor of History, Reed College

AS A HUMANIST, I well remember the hours in which I worked over those statistics from the pre-Institute research report and endeavored to discover what chi square meant! As a matter of fact, I think I found out, but I'm not going to talk here about anything very specific. I want rather to take the long view and talk about the place of the college in the selection and preparation for medicine from a rather general position. I shall, of course, speak from the point of view of a particular ideal with regard to a college, and I suppose that means a particular college or, to use Institute language, a particular subculture.

If this is taken as the qualification for what I might say, you may take it for what it may be worth. In other words, I want to turn this business around a little and not talk about what should the medical schools expect from the colleges, but rather what may the medical schools actually, in fact, get from the colleges.

I am not sure the collegiate point of view and the medical school point of view are so far apart; at least I shall try to see if they can be brought together. This purpose is, of course, obvious. It has already been suggested that the medical school does not determine the college curriculum except, perhaps, a small portion of it. It certainly does not, I trust, determine the general atmosphere and condition of the curriculum or the teaching methods on a college campus. Nor, of course, do the medical schools claim to do so.

What is it then that the medical schools should get or will get? I think it goes without saying (there is some confusion about this matter) that there must be a background of knowledge and of technique in the basic sciences and in the use of the English language. By the way, I sometimes would like to know why the English language is put in this position, whether it is because it is a technique that must be used by all of us in communicating with others understandably, or whether it is because writing the English language tends to shape our own thinking and is a form of self-criticism without which we cannot think clearly and effectively.

That already suggests that I am not sure that this background of knowledge and techniques as such is sufficient. What more? Are there some peculiar qualities that are necessary for medicine? And not necessary for other things? I mean outside of this basic knowledge and techniques that one might get in college. A number of speakers here have noted the variety of activities that the field of medicine really covers. It is true that perhaps most of the graduates of medical schools go out to the profession of doctor, but many of them also become research men; others become teachers. In other words, here you would need a variety of specific capacities for these particular functions.

There may well be certain general qualities that we expect of professional men, indeed I would say of any men with intellectual and responsible roles in society. Perhaps the college should be concerned with these qualities.

It is a truism, of course, that the doctor is not simply a technician and a craftsman, with the sort of training that may be related to success in the first two years of medical school curriculum.

I have heard considerable discussion of this problem, and there does seem to be some general assumption that there are qualities that may be necessary for success in the first two years—different qualities from those necessary for the clinical years to follow. Be that as it may, we know that a doctor is also (we hope) a scientist and an artist, that he is in addition a member of society, that as a man or a woman he or she must live with himself or herself as a human being. These are the kinds of things outside the special fields I have mentioned in which, it seems to me, a college of liberal arts should be interested in the preparation of students for the role of educated men in our society—whether the preparation is for medicine or for law, business administration, teaching, or what-not.

I would say the genuinely well-prepared student has qualities that are not purely intellectual but partly personal. Somebody may have the intellectual capacity to pass a course with an A, but there is not the slightest evidence that he has really mastered that material so that he can use it. In fact, I don't know where you can cut the line at this point. What is curiosity, intellectual curiosity? Is it purely intellectual or is it a quality of personality or imagination? Is it intellect or personality that enables us to call up creatively new images and new ideas or, on the other hand, just simply to take a leap and hope that we land on our feet?

Then, of course, there is that whole realm of capacities that are related to what we call the empirical or scientific temper—the readiness to accept evidence, to use it, to demand it; the kind of judgment, the kind of critical judgment that goes with that; and of course the objectivity, that ability to get at a distance from the material so that one is not too personally or emotionally involved when making a critical judgment. In certain scientific directions it may be relatively easy to make this kind of judgment without the immediate emotional involvement that may distort our conclusions, but if that science is moved over into the field of personal relations, which a doctor must master, something is required that I think is emotional as well as intellectual. The same applies to the capacity to make decisions when they are needed, at the same time recognizing that they may be wrong and require revision.

Now, of course, there is another kind of quality that has also been talked about here at the Institute—certain kinds of stability, persistence, sense of security, calmness under stress. These are particularly moral qualities, I should say, or emotional qualities, if you prefer the word. It has interested me to find some discussion here of a problem that I have been puzzled about for some years. That is the question of the relationship between the rigid personality, so-called, and the flexible personality. You see here that the emotional and intellectual areas really can't be distinguished very clearly. Certainly the rigid is related to authoritarian attitudes, at least at one point, and these are connected with the kind of ideas which you are willing to accept and the grounds on which you accept them.

Take the case of the student I had two years ago who, from the very beginning in a group conference discussion in a course in humanities (where I hoped that he would learn better), kept asking me "what is the answer?" I would say, of course, there isn't any answer—the answer to this particular problem of the interpretation of this work of literature is what its meaning is to you. Then this student would say he couldn't find the "meaning for me," for there were lots of meanings, and he didn't know which one he should accept. Now that is the kind of problem of personality that I think we all face, and it is related to the general question of the qualities of this type of person in contrast with those of the more autonomous individual.

Perhaps this contrast is related in part to what Dr. Funkenstein called the pragmatic versus the ideistic (see Chapter 6), a distinction which is not itself simple. Certainly, it is not one-sided. There are pathological extremes of both kinds, and I suppose psychologists themselves would recognize this kind of dichotomy for the purpose of analysis rather than for the description of real personalities, because this kind of polarization would not be true of the whole range of more integrated personalities that lies between the two pathological extremes.

It may be evident that, if I had to choose between these extremes (although I would want something of this sense of the stable, that which you could put your feet on), I would be inclined toward emphasis upon the curiosity, the open-mindedness, the flexibility, the autonomy, the independent responsibility of the individual. Therefore, I would be speaking for that particular kind of collegiate subculture. At least it would be for students a challenge, an ideal aim. Of course, we don't manage these things. We work for them and we hope that some students will catch on.

Now, I haven't time to discuss the more difficult question: How can a college contribute to these ends and therefore, in this sense, prepare at least a certain type of premedical education? Can it do so by its selection? Well, I suppose partially so. It has already been said that it is not merely the acceptance of students in the first place but the attrition that often goes on in the early years of college—which means that the college's own program tends to preselect the students for medical school.

The problem to which I do not know the answer is this: How far—granted a given intelligence so that the student has the capacity for grasping the techniques and the amount of factual knowledge necessary in certain fields—how far is it possible to develop, to uncover, to stimulate, to encourage in our students some of these personality qualities that I have been speaking of? I am certain there is no subject that cannot be taught in such a fashion as to bring out such qualities, and I would be bold enough to wonder whether this is not true in the first two years of medical school as well as in the college curriculum itself, because the point is not so much the character of the subject matter as how the subject matter is taught. Is it that balance of freedom and control that enables a student to recognize that he is on the frontier and at the same time has certain solid ground under his feet, that he must get used to this situation and that this is the character

of the valuable intellectual adventure? This is the question that I would leave with you.

Before closing, let me sketch just briefly a voluntary course that we give for seniors at Reed College, which we call a senior symposium. The interesting thing about that course from the point of view of this Institute is that more than half the students are seniors in the natural sciences—chemists, biologists, physicists. In fact, the course is partly set up so as to encourage their participation. I can't avoid telling the story of a student who came to me last year and said, in the middle of the year, "I would like to get into this course. I know it is a year course, but could you let me in at the middle of the year?" I said, "What is your ground for wanting to come in in the middle of the year?" He said, "I have been accepted at medical school."

Well, the purpose of this course is to examine certain contemporary problems of value—value in the social and intellectual fields, critical values which modern man has to deal with. A different work expressing some attitude on a problem of value is discussed one evening a week from 8:00 to 10:30 or 11:00 whenever we get tired of discussing the subject—not of course because we get through. The one we did last week was Dostoevski's *Notes From the Underground*, and if you know that work you will know it is a study, not just of Russian society in the nineteenth century, not just of romantic ideas, but of the relation of the individual in any society to that society and to himself. Now this is the kind of thing which it seems to me is important in the collegiate enterprise of the preparation of doctors.

Is this the kind of student the medical schools want or not? I suspect that is up to them. When I first began to teach, I was never interested in the methods of teaching until I became convinced finally that the methods of teaching express a philosophy of the subject matter as well as of the nature of the students with whom one is dealing.

Since several speakers in this Institute have quoted from themselves, may I in closing quote from myself?

"How teachers teach reflects the kind of minds and personalities in society they want to encourage and to live with. Do they want inquiring, critically minded men and women, sensitive to the expression of ideas and of feeling, and discriminating and self-reliant in judgment? Do they want people to be open-minded enough to recognize that no one has a monopoly of sound principles or of good taste and to welcome the thoughtful conflicts of opinion? If so, instruction in school and in college [you can judge whether you ought to add medical school] should give students, as individuals and in groups, freedom and responsibility to develop and to test their own interpretations of materials and problems in the natural and social sciences and in the humanities."

E. General Discussion

AFTER THE PANEL, the meeting was thrown open to general discussion from the floor, and much of the transcript is reproduced verbatim in this section. Discussion focused chiefly on the problems of required versus recommended premedical courses, student attitudes toward the premedical group, and the undergraduate college role in guiding students.

DR. WILLIAM E. CADBURY, JR.: I wonder if any member of the panel has a comment that he would like to make, having either forgotten to make it before or having thought somebody else was going to make it?

DR. DOROTHEA S. MILLER: I was very struck by Dr. Arragon's phrase, "the valuable intellectual adventure." A disturbing reaction that we get back from some of our premedical students who go on to medical school is that they lose sight of the educational adventure. They come back to us with a feeling of disappointment that medical school isn't the high frontier, that it is a pretty bread-and-butter existence, particularly in the first two years. I do think that the well-trained college student gets some stars in his eyes and it would be a wonderful thing if the medical schools could keep the light shining better than some do.

DR. WILLIAM E. CADBURY, JR.: There is one comment I would like to make. Dr. Arragon said something about the medical school's influence on the colleges and added something to the effect that the medical schools do not claim to influence the colleges. I am quite sure that this is right, that they don't claim to influence the educational experience in the colleges, but I think that it is quite important that medical educators realize that they do in fact influence the colleges. As I said before, and I would like to repeat it, wherever your policies can influence college policies for the worse, those policies are questionable.

There is an area that has disturbed me greatly this year and I think you should be aware of it. I don't know what can be done about it; I don't know what the cause is nor do I have any suggestions for the cure. I find an increasing sense of hostility toward premedical students as a group among other students in the colleges. The cause of this may be jealousy of these young men for knowing where they are going; it may be something other than that. But I think it is quite a real problem and one with which we should deal if it continues to be as serious as I think it is becoming.

Now, I wonder if some of you in the audience have questions you would like to address to members of the panel, or comments you would like to make?

DR. THOMAS H. HUNTER: I would like to ask this panel of premedical experts their opinion of, to me, a very difficult problem of designing specific requirements for admission to medical school. We have been adopting a position recently, I think a sound one in general, of minimizing our specific requirements to the bare science requirement plus English in the hopes of leaving leeway of the maximum possible degree in the undergraduate school for the acquisition of a liberal education. More recently we have become more and more concerned about the behavioral sciences

and the question has arisen whether or not a specific requirement in a broad sense in the behavioral sciences is desirable. This is under discussion at the present time.

I would like to know the feeling of the group from the colleges as to whether this is a sound movement. I think we are all agreed that we want medical students to understand human beings and to understand something of the behavioral sciences, but will we further this or will we set ourselves back by announcing a fairly specific requirement, even though it may include a choice of anthropology, sociology, psychology, or something else under this category? Or would we be better off to make a general statement about desiring an understanding of human beings and of liberal education together with the already recognized scientific subjects which are required?

DR. DOROTHEA S. MILLER: I have a feeling it would be a very strange college curriculum that would not include some study of the behavioral sciences.

DR. THOMAS H. HUNTER: Is the implication then that we do not need to require this?

DR. DOROTHEA S. MILLER: That is my feeling, yes.

DR. NORMAN F. WITT: At least this is true in a number of colleges, colleges of arts and sciences; they have certain requirements they call lower division requirements which include various aspects of the humanities and social sciences. I think if the medical schools feel this type of training is desirable and necessary, then they should determine how many students don't already get this training in their college program.

DR. THOMAS H. HUNTER: But this gets into the whole business of recommended courses. You can recommend any number of specific things as desirable, but the pitfall is in the interpretation of that, and our position has been that we keep our requirements specific and to a minimum. But recognizing the importance of behavioral science in general, should we now take the jump and say this is a must?

DR. NORMAN F. WITT: Well, I would say that if the recommendation is a strong enough recommendation maybe it ought to be moved into the area of "required," provided that it has been determined that students do not get this in their general program.

DR. THOMAS H. HUNTER: But what will this do to the freedom of choice of majors?

DR. NORMAN F. WITT: I believe that the qualities we like to see in a physician are desirable in any professional man. Therefore I feel the colleges are trying to make a well-rounded individual in their general education program. I don't believe we should increase the requirements to such an extent that we limit too much the choice of a major.

DR. R. F. ARRAGON: From my point of view, I think it depends a good deal on what you mean by the behavioral sciences and why you would think of including them in the requirements. In other words, the behavioral scientists themselves have had great difficulty in defining what these fields are. I will give an extreme example of this. I, as an historian, have been

a member of the committee to make behavioral science awards for the Social Science Research Council, and we make awards to everybody from historian on the one side to psychologists, just short of rat psychologists, on the other side.

Now the reason I ask the question is that it seems to me if you mean by behavioral sciences certain aspects of psychology and social psychology, these are in a sense adding to the professional, to the preprofessional requirements. I should dislike seeing the preprofessional requirements increased. On the other hand, if you mean by this what Dr. Witt was talking about, that is the emphasis upon some more sociological and humanistic orientation on the part of the students, then of course it will come normally in the general education program and requirements of most colleges. If there are colleges in any considerable number which do not have these, then I should think it would be well to specify it, but I should certainly not like to see the preprofessional requirements increased. In other words, if you are going to put that one in, I think you ought to cut some of the others down.

DR. E. LOWELL KELLY: I would like to make the suggestion, or raise the question of whether medical schools have the guts to drop all requirements and simply say we will consider any graduate from any recognized college as appropriately prepared to enter medical training. I realize this may be a little bit shocking to think that we might have someone wanting to become a doctor who hadn't had any chemistry. On the other hand, I think the student with a reasonable amount of guidance would say that some inorganic chemistry might be desirable in going into the kind of course that is involved in a medical school. It seems to me that a great deal of gain could be achieved all around with practically no loss involved if we simply forget about requirements and merely say that people have to be educated before they start becoming tradesmen or professionals, whatever they are.

I think this suggestion might tie in with Dr. Cadbury's question, a very disconcerting observation that maybe there is some hostility towards premedical students. I am not close enough to undergraduate students to know whether this is true, but I rather imagine it may be true because of the degree to which the values dominant in the professional association of medicine are not shared by people involved in liberal education, either professors or people not in premedical training. Again it seems to me there would be a great deal of advantage in not having people identified as premeds at all, just folks going through college, some of whom are going to medical school, some to law school and so on. I realize this will get rid of some jobs as premedical advisers; some of these people might just become counselors of all students.

DR. ROBERT J. GLASER: In respect to the number of course requirements imposed on applicants, there can be no argument that excessive demands should be avoided. On the other hand, the courses applicants do take should be of top order. It has been of great concern to me, and I am sure to others, that a number of colleges in this country have set up courses designated by the euphemism "especially for premedical students." Often

such courses are watered-down and not much more than trade-school exercises. There are some excellent colleges that practice this double standard, and unfortunately their premedical students frequently are not exposed to the stimulating first-line courses in the sciences.

It seems quite reasonable to suggest that if a student wants to take chemistry, physics, biology, mathematics, or any other subject, he should be given the opportunity to enroll in the best possible course. And this should hold whether he is premedical, predivinity, or on his way to a career in Indic philology.

One other problem has recently come to my attention in certain colleges where there has been a notable and healthy trend away from the policy of urging premedical students interested in other areas of knowledge to concentrate in a science field in college. I have become aware of the fact that such students have been advised to take all their science courses in the summer rather than in the regular school year. Without casting aspersions on summer-school courses, it is difficult to believe that they are as valuable an educational experience as courses that are extended over a significantly longer period and allow the student more time for assimilation and reflection. As an admissions officer, I am delighted to treat the science and nonscience majors applying to medical school as equally desirable in the broad sense. I feel strongly that, as a general principle, both groups should have had the best courses available and not the most expedient ones.

DR. NORMAN F. WITT: Well, Dr. Glaser, I agree with you 100 per cent on that. Being chairman of the chemistry department at our university, I have always felt that organic chemistry is organic chemistry, that you didn't have to have organic chemistry for pharmacy students or premeds or any one of the other professional areas, and I think the same thing can be said about other courses. When a school offers a watered-down course it becomes so labeled and this puts a stigma on the student because he is taking something that isn't quite up to what the other students are taking, and if there is any resentment toward the premedical student in such a situation, this may be the reason. We have changed our course in analytical chemistry so that all students, regardless of what their majors are, take the same four hours of analytical chemistry.

DR. R. F. ARRAGON: This discussion reminds me of the type of courses that men I have known have suffered in teaching "English and history for business administration," whatever these may be. Of course there is another side to this (although I forget that I am not talking to my collegiate colleagues), and that is that some kinds of courses given in basic sciences are primarily intended for majors in that subject. It is, therefore, a pretty specialized introduction, and other students have to take it because it is the only way they can get the introduction. That is the other extreme, and I think there should be a kind of course that is good for all people, whether they are majors in the subject or premedical students or liberal arts students.

DR. D. BAILEY CALVIN: You referred to this attitude of students other than premedics on the campus. Some ten years ago at Union College we had a conference of similar nature and at that time there was a considerable

expression of feeling that some of the faculty members in the colleges resented somewhat having to teach the premedics, knowing that they were not going to be able, in many cases, to teach them during the senior year because they were going to medical school. They knew they would not have from among this group a choice for graduate studies in their field. I haven't heard that expressed in some while. Is that parallel somewhat to the student attitude toward premedics on the campus? Do you find that also in the faculty?

DR. WILLIAM E. CADBURY, JR.: I think probably Dr. Witt can speak best on this, since it is his college of the four represented here which sends an appreciable number to medical school after three years.

DR. NORMAN F. WITT: Well, I think that there has been some distress on the part of faculty members because some of the best students do go on to medical school. I can cite an example at our institution. One man was teaching a course for chemistry majors and he assumed that everyone in it was a chemistry major. On checking he found that some of the best students were premedical students majoring in chemistry. Last year two of the best majors we had in the department were students who went on to medical school.

DR. ABRAHAM WHITE: Dr. Cadbury, you suggested that the undergraduate colleges might assist, perhaps, in the selection of the desirable candidate for medical school, and I would like to suggest an area for future study that I think would be very helpful to the schools of medicine, as well as to the undergraduate college population, particularly in view of the likelihood that in the next five to ten years we shall have an increasing number of medical school applicants.

Would it be possible for the undergraduate colleges to explore the availability of tools by the use of which it would be possible for the faculties at the second or third year of the undergraduate education to set aside or to redirect those announced premedical students who, on the basis of the tests or measurements that are set up, are obviously ill-fitted for a career in medicine? This would, to a significant degree, avoid a number of problems that may develop at a later time, and at the same time it would be a great service to those candidates who are ill-fitted for a medical career and who suddenly come to the end of their undergraduate college education faced with a rejection from many medical schools—and find themselves ill-equipped for any alternative.

DR. WILLIAM E. CADBURY, JR.: I think I had better make my answer as brief as possible and then hope that the other members of the panel will also make their answers brief. My answer would be no, it would not be possible. To expand that just a little, we have a great deal of experience in the difficulty of dissuading students from applying to medical school when it is obviously hopeless. It seems to me that it would be a very serious matter for the college to make the decision that such-and-such a student was to be excluded from medical school on the basis of whatever evidence they have, as long as the responsibility for admission to medical school is primarily in the hands of the medical school. I think that for the colleges to take this

responsibility on themselves without having it given to them by the medical schools would be quite a mistake.

DR. ABRAHAM WHITE: Aren't you doing that, sir? Do we not have premedical advisory committees at the present time who do not recommend?

DR. WILLIAM E. CADBURY, JR.: Yes, but that does not keep the person from getting in. People do get into medical schools who are not recommended by their premedical committees. It would be a good thing if we were more successful in dissuading students from keeping up their hopes, but students do keep up their hopes and sometimes students do get into medical school even after we have told them time and time again that their chances are extremely slight. In my own experience, I have had students who I was perfectly sure were not going to get into medical school who did in fact do so. I grant you that they haven't done very well, once they got in.

DR. DOROTHEA S. MILLER: I would certainly like to give my answer which is completely at variance with yours. I feel that this is our second biggest responsibility as premedical advisers. The first responsibility is to help appropriate students get on toward medical school, but our second biggest job is to help redirect those who we are convinced are not suited for medicine, and we try very hard to do this as early as possible. So I think typically we have about 150 undergraduate freshmen entering in a given year who state that medicine is their aim. Their number is reduced by 50, I think, by the second year. Usually we have a group of about 50 who actually come up to candidacy, and this reduction is not because anyone has been hit over the head. Very often their eyes get opened without too much strain on anybody's part, but we do try to disabuse them if we are convinced that the aim is not realistic.

DR. WILLIAM E. CADBURY, JR.: I don't think that we really disagree on this, Dr. Miller. I think it is our responsibility and I think we should try to do it, but the question was: Could not the colleges forbid students? Is that not right? Could not the colleges acually exclude students from application to medical school?

DR. ABRAHAM WHITE: No, I suggested that the colleges redirect the student.

DR. WILLIAM E. CADBURY, JR.: Did you mean by compulsion or by persuasion? If it is persuasion, I agree with you, and I agree with Dr. Miller. I don't think it can be or should be done by compulsion, and short of compulsion I doubt if it can be done.

DR. DOROTHEA S. MILLER: In some cases aspiring students have to apply and be rejected before they are convinced.

DR. GEORGE PACKER BERRY: Dr. Cadbury, let me take just one moment. The word "compulsion" brings back the thoughts I have been having ever since I have been turning over the real implication of Dr. Hunter's question. I preface my comment by expressing appreciation to this panel, just as we express appreciation often to the people who come from the colleges who do us the honor of visiting the school, because they make such a big contribution toward keeping medical education *education*.

If you will let me stretch the semantics a little bit, I will just contrast

training and education, and say that in any professional field this is one of the most difficult problems to keep in balance, and one of the strange errors that medicine keeps making, it seems to me, is to feel that it can help achieve this balance through regimentation and compulsion. That is why I should resist enormously any proposal to add a new requirement to the so-called premedical requirements. I should hate very much to see any action taken to add anything in the behavioral sciences as a compulsion.

In the first place, you learn a great deal about the way man behaves in studying Shakespeare. There isn't any royal road to Rome in doing this. Different colleges do it in different ways. The thing we are all seeking is a far greater diversification in the educational opportunities that people can pursue so that they can grow in their own ways; to put restrictions into this is to go exactly backward. We have been working against this for a decade and I think this would be a tragic and foolish thing to do; if we could get rid of the rest of the restrictions, as Dr. Kelly suggested, I would be very happy about it. All you want is a reasonable understanding of the fields of sciences. They are like tool subjects, you want a person who has had a chance to grow, and this is another name for a liberal education.

Of course he has to include in his growth areas that add to his understanding if he is going to become a physician in the modern sense of the word. There are so many ways to do this that you just restrict them by requirements rather than enhance them.

CHAPTER 10 A Symposium

The Methods and Goals of Medical Student Selection

A. Introduction

BY JOHN L. CAUGHEY, JR.
Associate Dean, Western Reserve University School of Medicine

THE INSTITUTE PARTICIPANTS were led in a vigorous and challenging way to focus their attention on long-range evaluation of the whole process of admission by the two psychologists, Dr. John G. Darley and Dr. E. Lowell Kelly, whose papers are reproduced as Sections B and C of this chapter. These speakers emphasized the relation of admission procedures to the recruitment of desirable candidates, the identification of personal characteristics compatible with the stated objectives of the medical profession, and the orientation of the profession to the responsibilities the public expects it to assume in the community.

In the subsequent round-table groups the participants discussed the ideas suggested by the psychologists. Much consideration was given to the ways in which new techniques of evaluation could be applied by medical schools to problems in establishing and carrying out admissions policies. Humility was expressed in recognizing the inadequacy of some present admissions procedures and the means used to evaluate their success. It was evident there was renewed awareness of the key importance of a successful admissions program—to the medical schools themselves and to the community in which future health services would be rendered.

The principal result of the discussion of this topic was realization by the participants of the great need for continuing well-organized study of medical student selection. They appreciated the contributions that could be made by psychologists in this respect and recognized that further important help might come from sociologists, cultural anthropologists, and other students of human nature in subjecting the admissions process to the kind of orderly investigation that has been so successful when applied to other medical problems.

One suggestion made during the Institute was that the Association of American Medical Colleges sponsor some arrangement whereby admissions personnel from the medical schools could come together on a regular basis to learn more about techniques of applicant evaluation, to hear reports about research projects in personnel selection, and to discuss and plan for joint efforts to improve recruitment and appraisal of candidates for the medical profession. This idea received enthusiastic endorsement

from the participants in their discussion groups.[1] Some school representatives suggested that, in addition to an annual national meeting of admissions personnel, it would be profitable to have regional meetings on a more frequent schedule to deal with important local problems.

The reports from the discussion groups indicated that, within our present frame of reference, medical school admission programs are functioning satisfactorily, even though they might be improved by more rigid adherence to rules suggested by the Association. Each school does have techniques for handling applications and appraising candidates, and these are good when evaluated simply by the success of the admitted candidates in graduating from medical school and passing licensure examinations.

However, the real challenge lies ahead and has not been accepted by medical faculties and admission committees. This challenge is to define more precisely the expectations we have for members of the medical profession, to determine the intellectual and personal qualities which are necessary for the roles they are expected to play, and then to find means to attract, select, and educate the kind of students who, as physicians, will strive with reasonable hope of success to make the desired contributions to medical education, scientific research, and the health needs of their community.

B. Over-all Appraisal of the Admissions Process

BY JOHN G. DARLEY
Associate Dean, University of Minnesota Graduate School

TO SOME EXTENT I have a feeling that this trip was not really necessary on my part. Everything that I thought to say has been said and said well by my colleagues, and additionally many things that I had not thought of have been equally well said. One of my qualifications for appearing here is apparently my vast ignorance of the problems in medical student selection, because it has been a long time since I have dealt with undergraduates or with professional school students. Thus, I suppose I can substitute for knowledge a certain fervor and conviction. I am reminded of the book called *The Light That Flickers*, which is Dexter Keezer's account of his presidency at Reed College; the first chapter of this book is entitled, "How the Shirt Is Stuffed." This seems to be what is happening to me. I have been called upon to make cosmic statements based on very little knowledge; the fervor of my delivery and the conviction of my pronouncements will probably substitute for this knowledge.

Certainly I have not come to bury this particular Caesar, because

[1]This proposal has been approved by the AAMC Committee on Educational Research and Services, which has undertaken to arrange meetings of admissions personnel at the time of the Teaching Institutes and the Association's Annual Meetings.

in the affairs of men the problems of selection and evaluation have a strange and wonderful immortality. Certainly I cannot praise this Caesar too well on the basis of the comments that you people have supplied and the pre-Institute questionnaires that you have responded to. I have a faint feeling that there is something slightly lacking in the admissions process and I think I will try to mention some of the things that seem to me pertinent in that regard.

It may very well be that your concern for the admissions process grows out of a general ferment in higher education in which we are taking harder and harder looks at all of the things that we do in the entire process. We are being forced to make a great variety of decisions as we come to the limits of our resources, or as we come closer to the large numbers of students that lie before us in the years ahead. Certainly the processes of decision-making carried on by the faculty and administration are very difficult to evaluate and to complete satisfactorily.

Criteria for evaluation

I should like to skim through something that I think has been missing here in the past few days, the touchstones or yardsticks by which this admissions process is itself to be evaluated. Many of these have been implicit in everything that has been said in the past few days, but let me try to make them explicit if for no other reason than to permit some discussion of them. I suppose that a first touchstone is the continued maintenance of a stable *selection ratio* in medical schools from year to year. This tells you the extent to which the field still attracts candidates. Here it would not be the admissions process alone that would be evaluated, but it would be in part the thing that has been referred to several times as the public image of the field of medicine. I think I should be concerned with the admissions process at any time that a severe or serious change in the selection ratio began to occur for any reason.

A second criterion for evaluating the over-all effectiveness of the process lies in the failure and withdrawal rate within medical schools. There is an assumption here, I think, that needs to be made explicit also: that the grading systems and standards within medical schools are adequate to their task and are properly used. It is one of my tasks at Minnesota to review periodically the records of all graduate students to determine whether or not they are meeting standards. It has seemed appropriate over the years simply to drop out of consideration the grades given in the graduate medical program. Certainly the students are evaluated by my colleagues on the clinical faculty for the Master of Science degrees and Ph.D.'s in the clinical specialties, but the evaluation is not reflected in the grading systems with which we have to deal. Whether this is true, and in what degree it is true in the undergraduate grading systems in medical education, I certainly am not competent to judge, but if you use failure and withdrawal rates as a criterion against which to test the effectiveness of your admissions process, then certain statements of a

categorical nature must be made about the goodness or the badness of the grading standards that apply in undergraduate education.

Another criterion might be the number of people who stay in the field and the delinquency rates, if you will, within the practice of medicine. Defection from medicine is a rare event, certainly, and the nature of the sociology of the profession is such that leaving the field is extremely difficult, so this criterion probably is not of great worth. The nature of the internship and the residencies, I think, has been presented as a possible criterion. The amount of advanced study undertaken and, more importantly, completed; the nature of specialty board membership among the graduates of a particular school; the social acceptance of the group, the group in this case being medicine—these are all additional yardsticks by which to evaluate admissions. Finally, one way of considering the evaluation of the over-all process of admissions in medical education would be the long-range changes in the characteristics of members of the entering classes or members of the applicant group.

All of these, as you will clearly and immediately recognize, are only partial yardsticks. Some of them are quite hard to measure, some may reflect situations or changes which come into being after you have done your job as admissions officers and committee members, even after you may have done your job as faculty members. These may very well be changes which no set of admissions procedures could foresee, and therefore, for which the admissions procedures could not be held accountable.

The diversity of standards

I think the most important thing with which we deal here is that any attempt at appraisal or evaluation assumes that a philosophical or value position has been taken or has been made explicit or has been agreed to. For some of the items in the field of medical education and practice, certainly there are common values; these are well reflected in the history and the evolution of the profession. But for others perfectly sound alternative positions could be taken. For example, one might stress the need for general practitioners on the one hand to meet certain community needs, and at the same time stress the need for the specialists. One might defend the existence of specialty boards as serving, as I am sure they do, a very real function in the evolution of the profession. Alternatively, certain values may not be wanted by the group that is in control of the enterprise, but may be wanted by the society this group serves. The issue here can be seen, I think, in naked form in whether you can, should, or will expand medical training facilities, and whether or not certain forms of prepaid medical care will be permitted to exist. In this particular situation, the value of the society served and the value of the professional group tend to dictate different answers.

The evolution of a profession is in itself an extremely interesting process. One thing that is truly characteristic of a profession, I think, is that it comes to have a closed system of control in which decision-making

tends to be carried out by members of the group and not by anyone outside of the group. Whence, then, comes the impetus in our philosophy and value system for reform or even the evidence that reforms may be needed?

Certainly, the very brilliant talk given by Dr. Funkenstein (see Section B, Chapter 6) gave a particular kind of impetus from within. Your presence here and the amount of work that has been done in preparation for this meeting would indicate that all of you feel some uncertainties and insecurities about the goodness of the enterprise upon which you are embarked.

Now, one might expect a profession to be quite homogenous, looking at it from the outside, with respect to training, and with respect to admission standards. Your appeal to the public is made in part on the fact that you are homogenous in the possession of certain minimal basic skills involved in the healing arts. Yet, the evidence on the heterogeneity of students assembled through the *Medical College Admission Test* materials and through the results of other objective measurement procedures might raise interesting questions of whether we have really an absolute standard for the practice of the profession or whether we have here, as we do in many other areas, a high degree of relativity with respect to standards. How much homogeneity is desirable within a particular profession with regard to training and matters of this kind?

In the graduate medical program at Minnesota, we face, I think, an interesting example of enforced professional activity. Historically the Master of Science in a clinical specialty and the Ph.D.'s therein served a very real purpose in the evolution of medicine, to guarantee that there would be specialties and that the public would have some assurance that the person who claimed the specialty could practice it. The evolution of the American specialty boards came after the evolution of these programs in graduate medical education. At Minnesota we now face an interesting anomaly. I am sure you face it elsewhere also. That is, that many of the people who enter the Mayo Foundation program and the graduate program of Minnesota are truly there on the residencies and fellowships serving the time that is necessary to permit them to present themselves to the appropriate specialty board. Yet, we maintain the fiction that all of them are there as proved scholars and research workers and teachers in the medical sciences, that they are to get the Master of Science in the clinical specialty or the Ph.D. therein, and that they will move in a particular way into the stream of research and teaching. The extent to which this is true elsewhere I do not know.

At a meeting of our joint medical committees, I suggested that part of this dilemma could be eliminated if we merely gave these students certificates of attendance, a sort of good-conduct medal, and concentrated after we had had them for some years on finding within these populations the men who really wanted to be medical researchers and teachers and scientists. To them we could then give the degree that would have the meaning which the Master of Science in the clinical specialty should truly have. As I remember, the suggestion was greeted by one of the more thundering silences of my long period of service.

The medical student image

What image are you working with, or against, with respect to the kind of students who self-select themselves to come before your admissions committee? To what extent can you change this self-selection, or do you want to change this self-selection, or do you need to? I have not had an opportunity to go over fully the materials analyzing the freshman student questionnaire, but I was able to skim through it a little and let me see if my reading of it is of interest to you.

At the point of admission you are dealing with a group, probably of average age 21 or 22, who for the first 18 years lived in urban communities in homes that would probably be in the upper 2, 3, or 4 per cent of the income standards of the entire United States; they had comfortable homes; at least one of their parents was, typically, completely college educated. The index figure for their income would be probably $8,000 a year or more. These facts suggest a comfortable living, a life characterized by conservatism and characterized by a certain type of conformity. (See Tables 8.1 to 8.5 in Chapter 8.) These are the people who have been screened in part by the liberal arts colleges before coming to your selection committees. You select some of them with a high degree of imprecision; this is not unique for medicine, it is true of all fields, and I will give you some index of that imprecision in a moment. You put these students in a highly rigorous and competitive situation in the medical school. They were originally to a considerable extent economically motivated to medicine, and now you put them into an internship, followed sometimes by residencies. You hold over their heads now the concept of a specialty board. You use them as residents and fellows, as a form of Chinese cheap labor, to render wonderful hospital service in your teaching institutions. You pay them at the prevailing low hospital rate and ultimately they come before the specialty board. I am not sure what the mortality rates of the specialty boards are, but some of them are quite high, I believe. Ultimately these people are boarded members of the profession and they have had it. You have held them in a state of high economic dependence for a long time and they are now going to catch up with the world. They move on into the areas of urban practice in large part and into specialty practice.

This then is the type of raw material that you take into your medical school, on whom you try to work your particular magic and whom you send innocent into a society to accomplish certain things at a quite high social and economic level. This certainly is not the professional group that is represented here at this Institute. The admissions committee, as has been pointed out, and the participants in this conference, are themselves biological sports with respect to the total enterprise of medicine and this, I think, is a very good thing.

Is it your job as members of admissions committees and as medical college administrators to change the effect of the public image that has been built up as a by-product of professionalization over the long history of medicine? If it is your job, will the faculty members concur in the decision that you make to do it? Will you be able to shake loose the kinds

of students you get into a different set of patterns of behavior? I am not entirely sure that you will, with whatever interest and sincerity you may have in undertaking the task. Whence, then, will you get your teachers and researchers and scientists? How can you reproduce your own medical faculties over time? These are the kinds of problems, I think, that require prior decision and differential activity on the part of the admissions committee, if you are to make changes.

At what point in its history does a profession inevitably lose contact with those whom it serves or those whom it undertakes to lead? I certainly don't know the answer, but I would try to impress on you something that has come up several times: it is essentially within a philosophic context and within certain choices of values that the over-all admissions process of medical education must be ultimately assessed.

Suggestions for selection research

Now, let me make just a few technical comments. There are clear upper limits on the power of psychological tests to predict outcomes. Let us confine ourselves for the moment to the training outcome, to the pass-fail criterion. I should suggest that the maximum accuracy obtainable with the best available tests and the present criteria is an accuracy indexed by a coefficient of correlation of about .60-.65, and let me translate this into words that may be a little more helpful.

This means that out of every 100 people about whom you have to make your prediction of passing or failing, you will probably be right in 58 to 64 cases of the 100 in correctly identifying students as passing or failing. You will be wrong in the remainder of the cases, and there is nothing on God's earth that the psychologists can do to help you get much above that level of accuracy with the criterion measures that you make available to us.

Have you reached that level of predictive accuracy within your program? I am afraid that you have not. Is it worth while to move from your present level of precision up to that level? I rather think that economically it is. In other words, it would be worth it, because the cost of educating one person in medicine is sufficiently expensive so that it would be a real economic value to move nearer that ceiling of prediction. Now the thing that fascinates me in listening to the discussion is that each of you is playing a wonderful role as his own digital computer. You are putting impressions, beliefs, convictions, experience, and wisdom into each of your heads and coming out with certain kinds of recommendations regarding admission or rejection. This can actually be done much better by modern computers or even a simple Monroe calculator.

I am reminded in this context of two true stories. A colleague of mine at Minnesota teaches an introductory statistics course; one of the tasks is that the students must learn to run coefficients of correlation. A student reported dutifully a laboratory exercise in which she said that the attained correlation between two variables was of the order of .60 but she simply didn't believe it. The instructor wrote on the paper, "My dear Miss Smith,

Karl Pearson invented this statistical technique in the latter part of the nineteenth century so that matters of this sort could be removed from the realm of belief."

I felt much as he must have felt in listening to some of your discussions about whether the MCAT is really good or not, and whether we believe or do not believe its attained prediction values. I am also reminded of a story of a teacher at Harvard who, in the middle of a statistics course, asked a student a particular question; it was obvious that the student was nowhere near any contact at all with the instructor. So he took him gradually back to the beginning of the course, finding always islands of ignorance. His final comment was, "Well, at least, Mr. Jones, you have lost no ground in this course."

I have a feeling that somehow, gentlemen, possibly by our own fault, some 50 years of development of psychometric methodology and research have passed you by.

I do believe that you could come closer to the obtainable ceilings, the possible actuarial ceilings, and it would be economical to do so with your present criteria. I am interested also in the number of variables that you undertake to assess in the admissions process, as itemized in Table 4.1 in Chapter 4. These are quite impressionistically stated, without real definition and without any clear evidence of the operations by which they are to be measured. I was equally impressed by the fact that the variables which are of concern to you, regardless of the degree of confidence placed in them, are variables which, so far as I could tell, do not differentiate the profession of medicine from any other human creative activity. You are seeking to find in your students exactly the same things, as far as I could tell, as are lawyers, engineers, graduate deans, and recruiting officers in many other fields.

Certainly you are not doing as well as you could with structured measurement and you are seeking to assess, I think in an uneconomical way in terms of the time at your disposal, variables for which you have not arrived at any operational definition. Such things as character, integrity, interest in medicine, and so on seem to have a great variety of meanings and definitions for you.

I was interested that the participants in this conference show a relatively low percentage of time spent on patient care and research; these data appear in Table 10.1. If this is true, are you selecting students in your own image, and is this the image of the faculty for whom you are selecting? Directly comparable data were not available in the materials for the admissions committee members, but if I read Table 10.2 correctly, at least 51 per cent of them appear to have an administrative role; and in Table 10.3, 69 per cent of them are drawn from the ranks of associate professor and above. I am curious as to what would happen if the composition of the present admissions committee were markedly changed. Would this make any difference in the image of those who would be selected in future years by this technique?

I am curious to know who does the selection research within each

TABLE 10.1

DISTRIBUTION OF WORK ACCORDING TO ADMINISTRATIVE POSITION
(Participants group)

Administrative position of participant	% of 91 participants citing proportion of time spent in various areas of activity							% of participants in each administrative position
	None	1–20%	21–40%	41–60%	61–80%	81–100%	No response	
				Work devoted to teaching				
Dean or president	9	19	1	0	0	0	0	29
Other deans	5	21	19	2	1	0	0	48
Other positions	0	2	13	7	1	0	0	23
All participants	14	42	33	9	2	0	0	100
				Work devoted to administration				
Dean or president	0	0	0	1	7	21	0	29
Other deans	0	1	13	17	5	12	0	48
Other positions	1	8	10	3	1	0	0	23
All participants	1	9	23	21	13	33	0	100
				Work devoted to patient care				
Dean or president	25	3	0	0	0	0	1	29
Other deans	33	11	2	1	0	0	1	48
Other positions	14	6	1	1	1	0	0	23
All participants	72	20	3	2	1	0	2	100
				Work devoted to research				
Dean or president	24	3	1	0	0	0	1	29
Other deans	17	21	9	0	0	0	1	48
Other positions	4	6	11	1	1	0	0	23
All participants	45	30	21	1	1	0	2	100
				Work devoted to other activities				
Dean or president	27	1	0	0	0	0	1	29
Other deans	44	2	1	0	0	0	1	48
Other positions	23	0	0	0	0	0	0	23
All participants	94	3	1	0	0	0	2	100

TABLE 10.2

TEACHING DEPARTMENT AND ADMINISTRATIVE POSITION OF ADMISSION COMMITTEE MEMBERS
(Committee members group)

Teaching department	% of 534 committee members in each dept. according to their administrative position					Total % in each teaching dept.
	Dean or president	Other deans	Department chairman	Other	None given	
Clinical:						
Medicine	1	3	2	3	10	19
Obstetrics/Gynecology	*	*	1	0	2	3
Pediatrics	*	*	1	*	2	4
Psychiatry	0	*	1	2	3	7
Preventive Medicine	*	*	1	1	2	4
Surgery	0	*	*	2	4	7
Radiology/Radiobiology	0	*	*	*	1	1
Clinical joint appointment	0	*	0	*	1	1
Other clinical	*	*	2	*	2	5
Total Clinical	2	4	9	9	27	51
Basic Science:						
Anatomy	1	2	2	1	5	11
Microbiology	0	*	2	*	2	4
Biochemistry	*	1	3	*	4	8
Pathology	1	*	1	0	4	6
Pharmacology	*	*	1	0	2	4
Physiology	*	1	2	*	2	5
Basic science joint appointment	0	*	*	*	1	2
Other basic science	0	*	0	1	*	1
Total Basic Science	3	5	11	2	21	42
Other:						
No Department	1	2	0	3	0	6
Other (not classified above)	0	*	0	*	*	1
Total Other	1	2	0	3	*	7
Total % in each position	6	11	20	14	49	100

*Less than 1 per cent response.

TABLE 10.3

TEACHING RANK AND DEPARTMENT OF ADMISSION COMMITTEE MEMBERS
(Committee members group)

Teaching department	% of 534 committee members in each dept. according to teaching rank							Total % in each teaching dept.
	Chairman	Professor	Associate professor	Assistant professor	Other	None	No response	
Clinical:								
Medicine	1	4	5	6	3	0	0	19
Obstetrics-Gynecology	1	1	1	*	0	0	0	3
Pediatrics	1	1	1	1	*	0	0	4
Psychiatry	1	1	2	2	1	0	0	7
Preventive Medicine	1	2	1	*	0	0	0	4
Surgery	*	1	2	2	*	0	0	7
Radiology-Radiobiology	*	*	*	*	0	0	0	1
Clinical joint appointment	0	1	*	*	0	0	0	1
Other clinical	2	1	1	*	1	0	0	5
Total Clinical	8	12	13	13	6	0	0	52
Basic Science:								
Anatomy	3	4	2	2	*	0	0	11
Microbiology	1	1	1	1	*	0	0	4
Biochemistry	3	2	2	1	0	0	0	8
Pathology	1	2	1	1	*	0	0	6
Pharmacology	1	1	2	*	0	0	0	4
Physiology	3	1	1	*	0	0	0	5
Basic science joint appointment	*	1	*	*	0	0	0	2
Other basic science	0	*	*	*	*	0	0	1
Total Basic Science	13	13	9	5	1	0	0	41
Other:								
No department	0	0	0	0	0	6	0	6
Other (not classified above)	0	*	*	0	*	0	*	1
Total Other	0	*	*	0	*	6	*	7
Total % in each rank	21	25	23	18	6	6	*	100

*Less than 1 per cent response.

school and who should do it. Certainly you must have the central AAMC research agency, but as has been indicated here by Dr. Kelly and others, local research provides you with certain types of outcomes that permit you to study the particular and unique culture of the individual medical school. Who does your selection research and how well is it done? Who should do it? Should you carry forward research on the training process itself? If so, by whom should it be done and at what particular point? Should you do something about your grading system and procedures? I sincerely hope that you do.

Are there some evidences of regionality? What impact does this have on the selection process? Table 10.4 indicates that 76 to 100 per cent of the entering classes of about half the medical schools come from the state in which the school is located.

TABLE 10.4

1956 MEDICAL FRESHMEN WHO ARE RESIDENTS OF THE STATE IN WHICH THEY ARE ATTENDING SCHOOL
(Participants group)

Proportion of state resident medical freshmen	% of 91 schools
0– 25%	17
26– 50%	13
51– 75%	16
76–100%	54

I think Dr. Funkenstein gave the clearest picture of what you can do with the noncognitive factors about which so much concern is shown. Can these be used in admissions as such? I would say that they could be used only to identify certain extreme deviants. Certainly they can be used as ways of studying the subculture of the particular medical schools and as ways of making available to the student the kind of help that was envisaged when you, yourself, created a committee on student personnel practices.

Now, I don't know what this all adds up to. Generally speaking, the opening and closing remarks that a stuffed shirt is called upon to make seldom add up to anything. The fact that you are here, the fact that you are showing a great willingness to stand up under several days of quite real punishment in the sense of sitting and listening to us, would indicate that you have a real and vital concern with your problem. I am sure that the power of small groups of dedicated people to bring about changes in human behavior and human affairs is real. The future of your own profession lies more largely with you and your faculty colleagues than it does with the men who have now gone out from your training, and you can shape this any way you want, but you must decide what philosophy it is that will really prevail, or more properly, how many philosophies will prevail in our wonderfully pluralistic world.

C. Multiple Criteria of Medical Education and Their Implications for Selection

BY E. LOWELL KELLY
Professor of Psychology, University of Michigan

HERE I SHALL DISCUSS the role of the admissions process in an over-all quality-control program of professional education in medicine. I especially wish to emphasize the fact that an adequate quality-control program can be achieved only by giving much more careful and considered attention to the matter of criteria than we have thus far done in these sessions. I shall also call your attention to certain available data regarding the kinds of persons who are now entering the profession. Finally, I shall attempt to challenge you by raising the question of whether or not you wish to undertake the task of remolding the profession of tomorrow more in line with the values and the ideas that have been expressed in these sessions.

"Quality control" is a term that has come into widespread current usage in industry to define, not one operation, but a whole series of related programs of evaluation. It includes appraisal of the raw material entering the plant and inspection of the finished product. It can even include evaluation of the consumers' satisfaction with and acceptance of the product. It involves continual surveillance of all successive steps in production. The over-all quality-control program is designed to increase efficiency and economic return, i.e., the values a particular firm lives by.

Here at the Institute, you have been primarily concerned with the question of how to get the right kind of people into medical school training. Many of the speakers, and particularly Dr. Funkenstein (see Section B, Chapter 6), emphasized the very close interrelationship between the kind of student, the kind of teaching, the kind of curriculum, the kind of subculture, and the kind of society in which the physician is going to live. I suggest that not only the profession as a whole, represented through your institutional association, but also every individual medical school can ill afford not to institute a program of quality control—one envisaged as involving not only student selection but a continued evaluation of curriculum and the impact of the teaching program and the curriculum on the students. The goal of all this would be to determine the degree to which you are producing the kind of product that you want to produce.

In this connection I particularly want to emphasize the importance of considering alternative criteria, i.e., alternative criterion measures, rather than relying on the one which happens to be convenient. Most of the research on the selection process has erred in the past by picking the handiest criterion, whether it happens to be the best or not. Everybody knows that grades are only one and perhaps a poor measure of success in college. Lots of other things may be more important, but practically all of the studies on predicting college success use grades as the criterion. They are so handy, convenient, and quantitative that we have not been led to develop success measures supplementary to college grades. The result is that we are still having studies published by people who apologize for the use of grades as a criterion, but they go ahead and use them anyway.

We did the same sort of thing in military personnel selection. There, however, we could blame our sins on the pressure to get selection programs working quickly. I am sure that Dr. Darley well remembers our experiences in the Naval Aviation Training Program in the early part of the war. One of our first tasks was that of selecting men for training as aviation gunners. These lads were to be trained to shoot down enemy aircraft from our own aircraft, using machine guns mounted in our own aircraft. Early in the war we didn't really know how to train these people, but by analogy it seemed likely that learning to shoot trap or skeet should help since it involved shooting at a moving target. We introduced skeet and trap shooting as a part of the curriculum. We also thought that people ought to know the names of the parts of machine guns and so on. Of course, skeet shooting provided handy criterion scores and it was easy to make objective achievement tests to discern whether people knew the names of gun parts or not. We soon found we could get a battery of tests to predict success in these handy criteria. It was not until relatively late in the war that we discovered that performance in trap shooting and learning the parts of a gun were negatively correlated with the ability to hit an airplane from your own airplane. Fortunately, the negative correlation was not so high but that we won the war!

It is entirely possible that some if not much of the present medical curriculum is not really critical or even essential to modern medical prac-

tice. I don't know enough to state this as a fact, but I do think that someone should be asking such questions. For example, I don't know how much *materia medica* the average physician needs to know. I suspect it may be less than he now learns but this may be a bias on my own part.

Since I am not a member of any medical school staff, I think I should tell you how I came to get mixed up in medical student selection. Shortly after we finished a five-year research on the selection of clinical psychologists, Wayne Whitaker phoned me one day and said, "Since I understand you have been working on problems of selecting professional students, I wonder if you would be interested in assisting the admissions committee by doing some local research on medical students?" My answer was to the effect that if all they wanted to do was predict medical school grades, I was not interested. Wayne suggested that maybe we ought to have lunch together and talk things over. In the course of our lunch, I was convinced that Wayne and his committee at Michigan were really interested in more important things than grades of medical students. The result is that we began a joint research project. Although this project is not yet complete, it is far enough along that we have a preliminary report. [It is reprinted immediately below to make available details not covered in Dr. Kelly's address.]

THE MICHIGAN PROJECT ON THE PREDICTION OF PROFESSIONAL COMPETENCE IN MEDICINE

by Wayne Whitaker, E. Lowell Kelly, and Leonard Uhr

General Nature of the Project

This project, begun in 1951, differs from most previous studies of medical student selection in two ways: (a) the use of a relatively large number of potential predictor variables representing very different domains (Table 10.5) and (b) a similarly broad sampling of different kinds of criterion measures (Table 10.6). This broad scale approach was practical because of access to high speed electronic computers.

Classes Studied

Two classes have been studied intensively. The class of 1952, tested as seniors, will be further evaluated next year, five years after receiving the M.D. The class of 1956, *tested as applicants* in 1952, has been followed for 4 years. The accompanying tables are based on this class—more specifically, on 112 of the 181 graduating members of the 1956 class for whom complete records were available. (The 69 members of the class not included in these analyses are in no sense deviant; most of the missing number were not registered during the "quarter" in which the sociometrics were administered.) Additional studies will be undertaken to identify the variables characteristic of students who did not complete the M.D. but these analyses have not been completed.

Criterion Measures

From the outset of this study, we have been searching for promising criterion measures to supplement the usual pass/fail or GPA criteria of medical school success. As will be noted from Table 10.6, we have thus far succeeded in accumulating 32 putative criterion measures for the class of 1956. State Board examination scores will become available shortly. As will be noted, these criterion measures fall into three broad categories:

1. Evaluation by professors (course grades, year by year GPA and Total GPA)
2. Evaluation by nationally prepared, administered, and graded examinations
3. Evaluation by peers

We had hoped to obtain evaluations of the several competences of a physician by clinical professors of these students but the mechanics of administering the form were not completed in time. We hope to obtain such evaluations next year for most of the class members by their internship supervisors.

ANALYSES

General

The general program of analysis called for correlating potential predictor and criterion measures. However, since there were 100 predictors and 32 criterion measures, this would have resulted in a rather large matrix of correlations.

On the assumption that the 32 criterion measures were not independent, we began our analysis by correlating each with the other.

(The resulting matrix of 496 correlations is available for inspection by any one interested.) A factor analysis (by K. W. Dickman and the Illiac of the Univ. of Illinois) indicated that five common underlying but uncorrelated factors accounted for most of the variance in the criterion matrix. The most meaningful rotational solution to the identification of the factors is presented at Table 10.6.

Factor Scores

In order to reduce the number of validity coefficients to be computed (and interpreted!) factor scores were computed for each student using the formulas shown in Table 10.7. While the factors are presumably independent of each other, it was not possible to obtain *pure* measures of the factors from the data available. The intercorrelation between the resulting factor scores are also shown.

Evaluation of Predictors

Each of the 100 predictor variables were correlated with the five factor scores. (Actually, because our computer program handles variables in blocks of 20, we prepared a matrix 100 by 20 and included a number of specific but not independent criterion measures; e.g., choice as family physician, public health interest, patient-disease orientation, 1st yr. GPA, 4th yr. GPA, over-all GPA, and National Board grades in Public Health, Medicine, OB. and Gyn., and Pediatrics. For technical reasons this matrix also included 5 Strong scores based on a re-administration of this instrument as seniors.

Table 10.8 lists the 45 predictor variables which correlated .25 or higher with at least one of the five factor criterion scores. Reading down the columns permits identification of the significant predictors of each factor score. Reading across indicates the degree to which each of the factor scores is predicted by each of the predictor variables.

Intercorrelations Among Predictor Variables

In order to permit computation of multiple correlations of two or more predictors and any criterion measure, it is necessary to know the intercorrelations between the predictors. In general, if two predictors correlate very high with each other, the combination of them may add little or nothing to the predictive efficacy of the more valid predictor. Therefore, an additional matrix was prepared showing the intercorrelation among the 40 most promising predictor measures. This matrix of 780 correlations is also too large for easy reproduction but is available for inspection. It contains some extremely interesting information: e.g., a significant correlation between marital status and anxiety and the correlation of ratings by admission committee members and data available to them at the time of assessment.

Combinations of Predictor Measures

Time has permitted the computation of only a few of the many interesting and promising combinations of variables for predicting factor scores or specific criterion measures. These (based on pairs of predictors only) are shown in the last part of Table 10.8. As will be seen, three of the five criterion factor scores can be predicted fairly well by the use of two predictors. The other two criteria are not well predicted by any of the specific predictors or by any combination of them. Possible reasons for this will be suggested.

Further Analyses Projected

(a) As the result of the AAMC testing program last spring, scores for the class of 1956 are now available from the A-V Scale of Values, from the Edwards Personal Preference Inventory, and the re-administration of the Strong. All of these "predictor measures" and the above mentioned additional criterion measures will be incorporated into an expanded analysis.

(b) By way of replication, a parallel analysis (as far as possible) is planned for the class of 1952.

(c) An effort will be made to identify distinguishing characteristics of students admitted to Medical School who subsequently failed or more typically withdrew and transferred to other graduate or professional programs.

Limitations of Study

(a) The most obvious limitation is, of course, that our data and findings are based on a single class at a single medical school. Preliminary analysis of the data for the class of 1952 indicate that our findings are generally applicable to Michigan. The extent to which they hold for other schools can only be ascertained by other studies. The nationwide study by the AAMC should be most valuable in this regard.

(b) We are still far from satisfied with available criterion measures of *competences as a physician*. We have utilized everything we could lay our hands on or devise but hope that the conference will provide still better suggestions for evaluating these critically important outcomes of medical education. We should especially like to have reactions to our proposed "Medical Student Evaluation Form" as a possible instrument for evaluating the 4th year student and also the intern. A draft of this form is available for study.

Before turning to our findings, however, I want to mention the things that struck me as most significant in that luncheon conversation nearly six years ago. "You know," Wayne said, "When the medical admissions committee says 'Yes' to John Jones and 'No' to Bill Smith they are making a decision that has to do with the allocation of a considerable amount of society's financial resources. In effect they are saying to one youngster, 'You may have a medical education largely at society's expense,' and to the other one, 'You may not; you don't deserve it.' "

"Perhaps even more important," Wayne added, "they are saying to the first one, 'By virtue of the small proportion of failures, you have an opportunity, in fact you are almost guaranteed the chance of earning at least a hundred thousand dollars more than if we say 'No.' " Wayne went on to say they would like to know how to select the kind of persons who might be inclined to return at least a part of society's investment to society. To me this was a challenging conception of an important problem and so we went to work.

We haven't yet solved the problems posed by that conversation, but from the very beginning I have been trying to persuade members of the admissions committee to assist in the search for criteria other than medical school grades. I have asked them and also many other physician friends: "What are the important, the socially significant criteria or characteristics of a competent physician?" I would like to know what they are and how we can best obtain measures of them.

We made a beginning in this direction at Michigan; if you will refer to the report and to the tables, I shall tell you what we have done. Our initial attempt to go beyond grades is reflected in the list of 32 criterion variables shown in Table 10.6. There, in addition to grades which represent the professor's evaluation of a student, you will note some 14 criterion variables obtained by a technique known as sociometric choices. On the assumption that students who work together very closely, particularly in clinical section courses, develop a pretty good idea of how competent the other fellow is, we decided to obtain a series of sociometric ratings. We tried to design a sociometric instrument that would permit medical school seniors to indicate those of their colleagues whom they considered to typify the extremes of several dimensions we regarded as important in young physicians. We ended up asking 14 questions. The nature of each is indicated roughly by the phrases under A in Table 10.6. The sociometric form is a very simple one: each student is asked to consider those class members whom he knows best (roughly 40 students) and to pick the one person with whom he would most like to go on a camping trip and the one with whom he would least like to go on a camping trip; next to pick the one that he would most like to have as an office partner and the one he would least like to have as a partner, etc. We feel that in this instrument we are beginning to get at some of the dimensions on which physicians evaluate each other.

We have been doing a great deal of thinking as to ways we could expand the number and variety of our criterion measures. As you see in

this table, we have accumulated a total of 32 indices, all of which in one way or another might be called criteria of medical education. We think there are many more that we haven't been able to identify or measure. We have considered many possible criterion measures and rejected them. For example, one might think that a physician is a good physician to the degree that his patients get well rather than die. As you know, however, the exposure rate is in no sense constant; some of the very best physicians are those who tend to see the sickest patients. The fellow who loses 50 per cent of them may still be a better physician than the fellow who cures 90 per cent with nature doing most of the work. We have, therefore, pretty much given up the idea of a direct objective measurement of good medical practice. We suspect that in the long run physicians are in the best position to evaluate the important competencies of other physicians, if we can only develop methods to utilize their judgments. We have reasonably high confidence in the value of the sociometric ratings we have now obtained in two senior classes and believe an extension of this method to groups several years out of medical school is not completely impossible.

Of course, the more criteria you get, the more complicated becomes the analysis of data. In our study, by the time we had 32 criterion variables, we also had 100 predictor measures (Table 10.5). Since this made possible 3,200 validity coefficients, we asked, "Isn't there some way we can introduce a little more simplicity and order to this thing?" Although we wanted more criteria, we also wanted to be able to make some sense out of our results.

More specifically we asked, "Are there some common factors running through all of these 32 criterion measures?" We therefore resorted to a statistical procedure called factor analysis. You don't need to know the technical aspects of it; just regard it as an effort to find the least common denominators running through these 32 criterion measures in Table 10.6. We were able to identify about five of these least common denominators; the degree to which each one of our criterion measures is related to these hypothetical dimensions or factors is indicated by the correlation coefficient with the factor (Table 10.6). We hope you will regard this table not as any final truth but as an indication that it is possible to obtain criterion measures other than grades.

Even so, you will note that the first three of these factors (see Table 10.7) all have to do with medical achievement in one way or the other. The second is by all odds the best measure as indicated by the relatively large number of variables highly correlated with the factor. We have labeled this General Achievement in Medicine, since it is most closely related to the total scores on the *National Board Examinations* as well as to medical school grades.

The first factor is not nearly so well identified or measured, but it is an interesting one that may be worth trying to measure better. This first factor seems to be characterized by those aspects of medical achievement associated with at least some of the preclinical courses, and appears to be somewhat different from over-all intellectual achievement in medicine. Perhaps it is associated with a willingness to work hard at any assignment

TABLE 10.5

LIST OF 100 POTENTIAL PREDICTOR VARIABLES USED IN STUDY OF MEDICAL SCHOOL OUTCOMES
(University of Michigan Project)

A. Strong Voc. Int. Blank Scores
1. Artist
2. Psychologist
3. Architect
4. Physician
5. Osteopath
6. Dentist
7. Veterinarian
8. Mathematician
9. Physicist
10. Engineer
11. Chemist
12. Production Manager
13. Farmer
14. Aviator
15. Carpenter
16. Printer
17. Math., Phys. Sci. Teacher
18. Ind. Arts Teacher
19. Voc. Agri. Teacher
20. Policeman
21. Forest Service Man
22. Y.M.C.A. Phys. Director
23. Personnel Director
24. Public Admin.
25. Y.M.C.A. Secretary
26. Soc. Sci. H. S. Teacher
27. City Sch. Supt.
28. Minister
29. Musician (Performer)
30. C.P.A.
31. Senior C.P.A.
32. Accountant
33. Office Mgr.
34. Purchasing Agent
35. Banker
36. Mortician
37. Pharmacist
38. Sales Mgr.
39. Real Estate Sales.
40. Life Ins. Sales.
41. Advertising Man
42. Lawyer
43. Author-Journalist
44. Pres., Mfg. Concern
45. Interest Maturity
46. Occupational Level
47. Masculinity-Femininity
48. Strong Anxiety
49. "A.V. Theoretical Values"
50. "A.V. Economic Values"
51. "Bernreuter F1-C" Self Confidence
52. "Bernreuter F2-S" Sociability

B. Background
53. Year of Birth
54. McQuitty Health Index
55. Own a Car
56. Father's Occupation
57. Father's Educ.
58. Mother's Educ.
59. % Self-Supporting
60. Am't. of Summer Earnings
61. Am't of Religious Activity
62. Am't of Pre-Med College

C. Undergraduate Record
63. Credit Hours, English
64. " " Foreign Lang.
65. " " Inorganic Chem.
66. " " Organic Chem.
67. " " Physics
68. " " Biology
69. Pre-Med Science Grades
70. All Pre-Med Grades

D. Ratings of Med. Sch. Admissions Committee
71. Member #1
72. " #2
73. " #3
74. " #4
75. " #5

E. Miscellaneous Variables
76. Marital Status
77. Month Accepted
78. Month Application Made
79. Height
80. Weight

F. Cattell 16 Personality Factor Inventory (Administered when Seniors)
81. Cyclothymia vs. Schizothymia (A)
82. Gen. Intell. vs. Mental Defect (B)
83. Emotional Stab. (Ego Strength) (C)
84. Dominance vs. Submission (D)
85. Surgency vs. Depressive Anxiety (F)
86. Character (Super Ego Strength) (G)
87. Adventurous Cyclothymia (H)
88. Emotional Sensitivity (I)
89. Paranoid vs. Trustful Altruism (L)
90. Hysterical Unconcern (M)
91. Sophistication (N)
92. Anxious Insecurity (O)
93. Radicalism vs. Conservatism (Q_1)
94. Independent Self Sufficiency (Q_2)
95. Will Control and Character Stab. (Q_3)
96. Nervous Tension (Q_4)

G. MCAT Scores
97. Verbal
98. Quantitative
99. Modern Society
100. Science

a professor gives—just for the sake of making a good grade in the course. This hunch is based on the fact that the highest loading is on Public Health grades given in the second year. At the time this class took it, this course was unpopular and was generally regarded as a difficult one. Looked at another way, I suspect this first factor may be an index of over or underachieving.

The third factor also seems to be a kind of medical achievement somewhat different from the other two. It too is not very well measured, but it appears to be the kind of medical achievement that shows up first in the clinical setting. Unfortunately, our grades for clinical courses are so relatively unreliable and so relatively little related to each other that we don't have a very good measure of the third factor.

Tentatively, then, we have what seem to be three aspects of medical school achievement. It may be worth trying to predict these separately.

More important, however, is the fact that this factor analysis has enabled us to get at two factors totally unrelated to these first three, which in one way or the other have to do with medical achievement.

The fourth factor I almost labeled Good Joe. This factor has to do with those characteristics that tend to make certain students popular with each other. You will notice in Table 10.6 that it is very highly related to being chosen as a camping partner, an office partner, an intimate friend, a colleague on a hospital staff, and so on. We have not been able to delineate this factor in any further detail. It is interesting to note the degree to which each of these various factors is associated with sociometric choices. Note that choice of a camping companion is highly correlated with Factor IV but not at all with Factor II—apparently they don't want to talk shop on a camping trip. In choosing an intimate friend, there is likewise none of this intellectual achievement, but in choosing the physician for their own family, they are willing to have a considerable amount of this academic medical knowledge involved. These findings make good sense.

The fifth factor is one of the most intriguing to me, both because it was found in our study of two classes and because of my own system of values. It is a dimension on which young physicians can discriminate each other, and yet it is one about which we have said very little in these meetings.

In Table 10.6 note the loadings on this fifth factor. The highest loading is negative and this is for the sociometric question: "Who do you think is going to make the most money in medical practice?" Remember that a student's score is a function of the number of times he is chosen by his colleagues. Judged future income, then, is correlated −.86 with Factor V. At the other end of the continuum we note a correlation of +.72 for the question: "Who do you think is most likely to find satisfaction as a general practitioner in a small community?

Other correlations are also of interest; the positive end of this factor goes with being selected as likely to be satisfied as a general practitioner, likely to be interested in public health, more interested in the total patient than in the disease entity. To me, this factor makes sense. We haven't measured it as well as we would like but hope that we have pointed to a possible dimension of some importance in medical education.

Table 10.7 indicates how we combined selected criterion measures to get five criterion scores roughly corresponding to these hypothetical factors. Table 10.8 is a summary of the correlations between promising predictor variables and these five factor scores. Note that the variables that predict one of these five criteria don't necessarily predict the others at all. As soon as one has more than one criterion by which to evaluate medical school outcomes, it is no longer enough to ask: "How good is a particular selection procedure?" but rather we must ask: "How well does a particular procedure predict each criterion?"

For example, the Physician score on the *Strong Vocational Interest Blank*, is unrelated to measured academic achievement in our sample, but several of the *Strong* scores are very significantly related to the probability of being judged high or low on Factor V which we have labeled Humanitarian

TABLE 10.6

LIST OF 32 CRITERION VARIABLES AND CORRELATIONS OF EACH WITH 5 HYPOTHETICAL UNCORRELATED FACTORS OR DIMENSIONS OF MEDICAL COLLEGE OUTCOME

(University of Michigan project; N=112)

Criterion Variable	Factor*				
	I	II	III	IV	V
A. *Sociometrically chosen as:*					
1. Camping Companion	−.05	−.14	.10	**.72**	−.05
2. Office Partner	.05	.19	.14	**.80**	.06
3. Worthy Recipient of Research Grant	.14	**.54**	−.07	.45	−.01
4. Intimate Friend	−.11	−.03	.02	**.83**	.08
5. Physician to Own Family	.00	**.45**	.09	**.77**	.06
6. Colleague on Hospital Staff	.06	**.31**	.01	**.85**	.05
7. Hospital Teaching Staff	.17	**.55**	−.08	**.67**	−.14
8. Likely to Make Highest Income	.03	.27	.16	.23	**−.86**
9. Finding Person. Satisfaction in G.P.	.00	−.15	.13	.43	**.72**
10. Medical School Teacher	.13	**.51**	.00	.46	−.29
11. Interested in Public Health	.13	.23	.11	.39	**.48**
12. Likely to Accept a Salaried Position	.13	.07	−.04	−.26	**.44**
13. More Interested in Disease Entity than Total Patient	.01	.39	−.05	−.50	−.37
14. Hospital Administrator	.04	.31	.04	**.80**	−.10
B. *Medical school grades*					
15. 1st year GPA	**.44**	**.70**	.00	.24	−.14
16. 2nd year GPA	**.59**	**.81**	.01	.17	−.12
17. 3rd year GPA	.15	**.86**	.16	.13	−.07
18. 4th year GPA	.07	**.56**	**.82**	.32	−.07
19. Overall GPA	.24	**.82**	.19	.19	−.15
20. Public Health (2nd yr. course)	**.57**	**.48**	.04	.10	.16
21. Medicine (4th yr. grade)	.07	**.47**	.27	.24	−.13
22. Surgery (4th yr. grade)	.11	.38	.35	.22	−.07
23. Ob. and Gyn. (4th yr. grade)	−.17	.14	**.40**	.28	−.07
24. Pediatrics (4th yr. grade)	.10	**.58**	.23	.19	.02
25. Psychiatry (4th yr. grade)	−.14	.04	**.56**	.09	.01
C. *National Examinations*					
26. Cancer Exam National Boards:	−.12	**.71**	.21	.02	.04
27. Medicine	−.27	**.79**	.07	−.05	.05
28. Surgery	−.27	**.76**	−.13	.05	.10
29. Ob. and Gyn.	−.11	**.71**	.08	.08	.01
30. Public Health	−.05	**.67**	−.10	−.06	.05
31. Pediatrics	−.22	**.82**	−.09	−.02	−.02
32. All Tests	−.17	**.91**	−.09	.02	.06

*Boldface values indicate variables with greatest saturations in each factor.

TABLE 10.7

INTERCORRELATIONS AMONG FACTOR SCORES*

(University of Michigan project)

Factor scores	I. 1st Two Years Grade Getting	II. General Achievement in Medicine	III. 4th Yr. Grades in Ob./Gyn. & Psychiatry	IV. Sociability	V. Service Orientation
I. 1st Two Years Grade Getting	—	.81	.07	.27	−.10
II. General Achievement in Medicine		—	.14	.20	−.19
III. 4th Year Grades in Ob./Gyn. and Psychiatry			—	.24	−.09
IV. Sociability				—	.03
V. Service Orientation					—

*Basis of Computing Factor Scores:

Factor Score	*Criterion Variables*
I	15 (1st yr. GPA) + 16 (2nd yr. GPA) + 20 (P. H. grade)
II	19 (Overall GPA) + 32 (National Boards, all tests)
III	23 (Ob. Gyn. grade) + 25 (Psychiatry grade)
IV	2 (Office Partner) + 4 (Intimate Friend)
V	9 (G.P., small town) + 12 (Salaried Position) − 8 (High Income)

Orientation or Humanitarian Service. If one wants to pick up the kind of fellow who is going to be happy in small-town private practice, one can do it with the *Strong*, but in doing so one won't necessarily be selecting applicants who are going to make the best grades in medical school.

In spite of all of the numbers in these tables, we are still far from

TABLE 10.8

CORRELATIONS BETWEEN 5 CRITERION FACTOR SCORES AND 45 PREDICTOR VARIABLES, EACH OF WHICH PREDICTS AMOUNT OF VARIANCE IN ONE OR MORE OF THE CRITERIA
(University of Michigan project; N=112)

Predictor variable	Correlation with factor*				
	Medical achievement			IV Sociability	V Service Orientation
	I 1st Two Years	II General	III 4th Year		
A. Strong Vocational Interest Blank Scores					
6. Dentist	.00	.04	*−.21*	−.06	*.30*
8. Mathematician	*.02*	.06	−.18	−.29	*.25*
9. Physicist	−.01	.07	−.09	*−.22*	*.32*
11. Chemist	.04	.11	−.19	*−.25*	*.28*
13. Farmer	.07	.12	−.17	−.03	.28
15. Carpenter	−.08	−.04	−.14	−.07	**.44**
17. Math. Phys. Sci. Teacher	*.20*	.16	*−.21*	.05	*.31*
18. Ind. Arts Teacher	.02	.06	−.16	−.02	*.38*
20. Policeman	−.07	.05	−.12	.11	.27
30. C.P.A.	−.09	−.10	−.02	−.15	*−.20*
36. Mortician	−.05	−.14	.20	*.20*	−.04
38. Sales Manager	−.02	−.09	**.26**	.13	*−.42*
39. Real Estate Salesman	.01	−.05	.19	.16	*−.36*
40. Life Insurance Salesman	.04	−.02	*.21*	*.21*	*−.33*
41. Advertising Man	−.01	−.02	.12	−.03	*−.37*
42. Lawyer	−.01	.04	.05	−.00	*−.34*
49. "A.V. Theoretical Values"	−.07	.03	−.19	*−.23*	*.23*
50. "A.V. Economic Values"	−.04	−.10	*.28*	.15	−.10
B. Background					
53. Year of Birth (Older-Younger)	*−.29*	*−.27*	−.09	−.11	*.28*
56. Father's Occupation Hi—Lo	−.05	−.17	.02	.13	*.31*
57. Father's Education Lo—Hi	.09	.19	.06	*−.21*	*−.35*
58. Mother's Education Lo—Hi	.04	.10	.20	−.09	*−.25*
59. % Self-Supporting (Intentions)	.01	−.09	−.09	.08	*.39*
62. Am't of Pre-Med College (3 yr. AB, MA)	*−.25*	*−.23*	−.12	−.10	.09
C. Undergraduate Record					
65. Inorganic Chemistry (♯ hrs)	−.19	*−.30*	−.01	−.04	*.23*
68. Biology (♯ hrs)	*−.26*	*−.27*	−.12	−.07	.10
69. Pre-Med Science Grades	.54	.49	−.05	*.20*	.10
70. All Pre-Med Grades	**.59**	**.54**	.01	.18	.00
D. Ratings of Med. Sch. Admissions Committee					
71. Member ♯1	*.40*	*.38*	.08	.10	−.02
72. Member ♯2	*.47*	*.48*	.03	.05	−.11
73. Member ♯3	*.47*	*.47*	−.02	.07	−.13
74. Member ♯4	*.35*	*.42*	−.06	−.01	−.06
75. Member ♯5 (Rated only on fraction of applicants)	*.25*	*.26*	−.06	−.05	−.08
E. Miscellaneous					
77. Month Accepted (Early-Late)	*−.31*	*−.30*	−.04	−.05	.12
78. Height	−.05	−.07	.01	.11	*−.28*
F. Cattell's 16 Personality Factors					
84. Cominance (D)	−.05	−.00	−.03	*−.21*	*−.30*
85. Surgency (F)	−.12	−.08	−.05	−.02	*−.32*
87. Adventurous Cyclothymia (H)	*−.21*	*−.26*	.08	.13	*−.31*
89. Paranoid (L)	*.24*	*.25*	−.04	−.03	.13
94. Self-Sufficiency (Q_2)	−.08	.03	−.03	**−.31**	.15
96. Psychosomatic Anxiety (Q_4)	*.22*	*.27*	.08	.03	*−.21*
G. M C A T Scores					
97. Verbal	*.36*	*.38*	.07	−.05	*−.21*
98. Quantitative	*.31*	*.31*	.01	−.12	.05
99. Modern Society	*.35*	.40	.01	−.02	−.19
100. Science	*.30*	**.41**	−.12	−.15	−.02
H. Multiple Correlations Based on 2 Predictor Variables					
70. Pre-Med Grades, plus 100. MCAT Science Scores	.61	.61	—	—	—
38. Strong Salesman, minus 49. Strong A.V. Theoretical Values	—	—	.26	—	—
36. Strong Mortician, minus 94. Self-Sufficiency	—	—	—	.36	—
15. Carpenter, plus 59. % of Self-Support	—	—	—	—	.52

*Values above 20 are italic and highest value in each column is bold.

satisfied with our criteria. We don't think we have all the important dimensions, but we are planning to try to get at some other measures of what may be very important dimensions of "the good physician."

Finally, I want to pose what I regard as a most challenging question. Findings such as I have briefly reported suggest that your group may

soon have techniques that will permit changing the nature of your profession in the years to come. I suspect that each of you, too, as a youngster had a very overidealized view of the medical profession. I used to think that most physicians were devoted to service, that they were primarily interested in taking care of the sick, doing good, helping out in community services, and so on. I would still prefer to believe this idealized image, but the data we have been collecting on our own medical students has shaken considerably my belief in this idealized image of the young physician.

I say this, in part, because conversations with our advanced students convince me of the truth of unpleasant accusations regarding recent medical school graduates: for example, that they are unwilling to make house calls at night, that they think they ought to make two or three times as much as their colleagues who didn't go to medical school, all without taking on any very much greater responsibilities to society than anyone else. Perhaps this is as it should be; I don't want to seem unduly critical here, but I want to give you a bit of additional evidence which leads me to worry about the kind of people who are becoming physicians.

What kinds of people are going into medicine today? As I scratch the surface of them just a little bit, using very different techniques, I get an impression of the typical medical student which is remarkably similar to the one delineated by Dr. Handler (see Section B. Chapter 5).

Essentially, our medical students are persons who, if they were not becoming physicians, would be planning to become manufacturers, big businessmen, production managers, engineers; they are not the kind of people who would become teachers, ministers, social workers, i.e., professional persons interested in doing something for the good of mankind. As a group, the medical students reveal remarkably little interest in the welfare of human beings. For example, one of the sharpest distinctions I can find between a group of physicians at Michigan and a group of clinical psychologists whom we have been studying, is their Farmer score on the *Strong*. I think you should know that the *Strong Vocational Interest Blank*, yielding as it does some 50 measures for the price of a single administration, often provides results that are surprising at first but begin to make very good sense after one has studied them. The Farmer key for the *Strong* is based on the modal interest patterns of highly successful graduates of scientific agricultural schools. Their primary interests and values are those of increasing production by the application of science. Such persons are not scientific in the sense that they want to discover new truths; their concern is rather the application of science toward the goal of increasing production. Medical students when compared with students in the other professions tend to have relatively high scores on the *Strong* Farmer scale.

Another characteristic of medical students is reflected by their relatively high scores on the Aviator scale. This sounds foolish at first, but the Aviator key is based on pilots of several different varieties: commercial pilots, military pilots, and so on. The one thing they have in common is maleness and a lack of any interest in anything cultural.

All of the evidence available to us leads to the conclusion that the *typical* young physician has little interest in cultural aspects of the society in which he lives, has very little sensitivity to or feeling for the needs of the community, and is generally not inclined to participate in community activities unless these contribute to his income. I am not saying this is true of all physicians; I am saying this is true of the modal young man going into one medical school. I am not sure of the degree to which I have characterized students in other medical schools; as soon as Dr. Gee's 20 per cent sample of the *Strongs*[1] come in, we will know how our medical students compare with those in other schools.

Because I strongly suspect that Michigan students are not atypical, I am worried about what is happening to the profession. Furthermore, I cannot but wonder whether or not those of us in possession of knowledge like this are not in a position to change the situation. Somehow or other, I tend to believe that the leaders of a profession have a responsibility to do more than merely observe that profession through whatever particular course of development it happens to be taking. I cannot but believe that leaders of a profession have a responsibility for the direction of its development.

These are hard words. As I see it, medical practice today, as characterized by the people going into it, is the last stronghold of individual economic competition, a stage through which big industry has already passed. It is my impression that the typical young executive in big industry today has a far greater sense of community needs and sensitivity to his role in helping society solve its problems than does the young physician who is still essentially an entrepreneur. Is this what you want? You are in a unique position; if you dare, you can select the next generation of medical students in a manner which will make the profession conform a little more closely to your ideals of what it should be. For example, our data suggest that if you want to select the kind of a lad who is going to be interested in public health, general practice, and so on, you should pick the person with a high *Strong* score on the Carpenter key. This is a person who has a relatively low upward mobile ambition in our society. If you want to be more certain of your selection, you pick a person who says he is going to earn a good share of his way through medical school; you pick a person who is more like a chemist or a physicist, than like the physicians on whom the *Strong* Physician key is based. I am not saying you must do these things, but if you don't you are either shutting your eyes to the availability of such evidence or saying that it is none of your business what the profession becomes.

Knowledge which enables you to predict the characteristics of the product of your medical schools puts in your hands the power to change the nature of the entire profession. Such power is almost frightening, but refusal to use it may be an abdication of responsibility.

[1]For a summary of research in progress, see Appendix C.

APPENDIXES

PAGE

Appendix A. *Supplementary Tables* 199

1. Admissions Policy and Procedures 199

2. The Interview and Other Appraisal of Non-intellectual Characteristics 204

3. The 1956 Medical Freshman 208

Appendix B. *Bibliography* 211

Appendix C. *Summary of Ongoing and Recent Research in Interest and Personality Measurement in United States Medical Schools* 218

Appendix D. *Roster of Participants—1956 Teaching Institute* 225

APPENDIX A – Supplementary Tables

I. Admissions Policy and Procedures

TABLE A.1
ACCEPTANCE PROCEDURES—TRAFFIC RULES*

1. No place in the freshman class shall be offered to an applicant more than one year before the actual start of instruction for that class.

2. Following the receipt of an offer of a place in the freshman class, a student shall be allowed at least two weeks in which to make a written reply to the medical school.

3. Prior to January 15, this written reply may be either a declaration of intent or a formal acceptance of the place offered. When the applicant has declared his continued interest within the two-week period, the medical school agrees to hold a place for him until January 15, unless he indicates that he has been accepted elsewhere and withdraws his application. He may, of course, and often will, enter into formal arrangements with the one medical school of his choice before January 15. Because of the wide variation in the acceptance dates of different medical schools, some students will wish to change their minds after filing a declaration of intent and it is understood that nothing unethical is implied when a student does so change his mind. In such an event, the student is obligated to send prompt written notification to every school holding a place for him.

4. The payment of a nonrefundable deposit shall not be required of any applicant prior to January 15.

5. When a student files a declaration of intent, a refundable deposit—not to exceed $100—may be required at the discretion of the school granting the acceptance. Such deposits will be refunded without question upon request made prior to January 15.

6. The deposit, when required to hold a place in the freshman class after January 15, shall not exceed $100.

7. By January 15 each applicant for whom a place in the entering class is being held must either accept the offer formally and pay any required nonrefundable deposit or withdraw his application.

8. Following January 15, an applicant offered a place in a freshman class must either formally accept or refuse the place, but he shall have at least two weeks in which to decide. Deposits made after January 15 shall be nonrefundable.

9. To assist the medical schools, the AAMC office will compile a list of the students who have formally accepted a place in the freshman class. This list will be distributed about February 1 and will be kept current by frequent revisions.

*These are the recommended procedures of the Executive Council of the Association of American Medical Colleges and have been approved by the membership of the Association. These so-called traffic rules are now observed by most medical schools.

TABLE A.2

TIMING AND METHOD FOR REJECTION NOTIFICATION

(Participants group)

Rejection notification	% of 84 U.S. schools	% of 7 non-U.S. schools
When notified		
As soon as action is taken by admissions committee	36	43
After action has been taken, but before selection of the class has been completed	19	14
After selection of the class has been completed	44	29
No response	1	14
How notified		
Form letter	48	57
Personal letter	32	14
Combination of above	18	0
Other	1	0
No response	1	29

TABLE A.3

METHODS OF SELECTING MEMBERS OF ADMISSIONS COMMITTEES

(Participants group)

Method of selection	% of 91 schools
Appointed by dean	66
Elected by faculty	10
Other	24

TABLE A.4

SIZE OF ADMISSIONS COMMITTEES IN RELATION TO SIZE OF 1956 APPLICANT GROUP

(Participants group)

Number of members on committee	% of 91 schools citing size of applicant group			% of 91 schools citing number of members on committee
	250 or Less	251 - 1000	Over 1000	
2 - 3	0	2	4	6
4 - 5	6	13	12	31
6 - 7	9	12	4	25
8 - 9	3	7	2	12
10 - 11	2	9	4	15
12 or more	0	6	5	11
Total	20	49	31	

TABLE A.5

MEMBERSHIP ROTATION OF ADMISSIONS COMMITTEES

(Participants group)

Membership rotation	% of 36 schools*
At least some members are replaced each year	47
At least some members are replaced every two years	6
At least some members are replaced every three years	14
At least some members are replaced every four years	6
Replacement is done at the discretion of an administrative officer	8
No regular replacement plan	8
Other	11

*Of the 91 participants, this 40 per cent stated that the admissions committee at their school changed by some rotation plan.

TABLE A.6

ADMISSIONS COMMITTEE OPERATION

(Participants group)

Committee operation	% of 91 schools
Meets as a group on all applicants	65
Meets as a group on most cases	22
Meets as a group on most difficult cases	8
Other	4
No response	1

TABLE A.7

COMMENTS ON COMMITTEE'S ROLE IN DEVELOPING ADMISSIONS POLICY AND PROCEDURE

(Participants group)

Committee's role	% of 91 schools*
Committee recommends policy to executive faculty	21
Committee makes policy	13
Committee recommends policy to dean	12
Committee makes a periodic review of policy	11
Committee recommends policy to administration	10
Committee recommends to dean; dean recommends to executive faculty or to administration	8
Other method used to make policy	11
Irrelevant comment	3
No comment	11

*Of 91 participants, 100 per cent claimed that the admissions committee at their school assisted in developing admissions policy and procedure.

TABLE A.8

SCHOOL POLICY ON FACTORS INVOLVED IN SCREENING APPLICANTS SERIOUSLY CONSIDERED FOR ADMISSION

(Participants group)

Influencing factor	% of 91 schools stating policy concerning factor			
	Publicly stated policy	Not stated but existing practice	No policy	No response
A. Negative consideration because of unusually old or young applicant:	18	51	30	1
Maximum age	11	35	40	14
Minimum age	7	25	48	20
B. Sex of applicants:	21	4	33	42
Men only; women only	7	2	68	23
Percent of applicants of each sex	2	8	53	37
Percent of each sex enrolled	3	10	50	37
C. Marital status	1	6	81	12
D. U.S. citizenship preferred	9	35	40	16
E. U.S. citizenship required	9	6	50	35
F. Negative consideration because of previous attendance at professional school:	11	36	49	4
Pharmacy	8	16	74	2
Dentistry	8	18	71	3
Veterinary medicine	8	13	77	2
Osteopathy	7	31	59	3
Nursing (B.S. degree)	6	13	79	2
Graduate school	3	2	89	6
G. Premedical course of study: Specific premedical programs over and beyond stated premedical requirements are preferred	19	13	64	4
H. Required minimum in college grades	33	36	30	1
I. Failure at another medical school	31	58	9	2
J. State of permanent residence	44	11	43	2
K. Preference given to:				
1. Children of physicians	1	13	84	2
2. Relatives of alumni	8	15	76	1
3. Relatives of faculty	2	17	80	1
4. Students from selected colleges	1	31	67	1

TABLE A.9

INFLUENCING FACTORS IN SELECTING STATE-RESIDENT APPLICANTS

(Participants group; multiple response)

Influencing factor	% of 91 schools
State law	0
Recommendations of state legislature, board of regents, etc.	46
Self-selection by applicants	60
None of the above	3
Other	15

TABLE A.10

OPINION ON STANDARDIZATION OF APPLICATION FORMS

(Participants group)

Opinion on standardized form	% of 91 schools
Favorable	26
Neutral	20
Unfavorable	54

TABLE A.11

COMMITTEE ESTIMATES OF VALUE OF PREMEDICAL ADVISORY REPORTS IN APPRAISING APPLICANTS

(Committee members group)

Applicant characteristic	% of 534 members citing value of premedical report in appraising various characteristics					
	None	Little	Some	Much	Report not obtained	No response
Character	1	9	52	33	2	3
Integrity	1	9	51	34	2	3
Motivation for the study of medicine	5	37	43	10	2	3
Leadership qualities	1	13	48	31	3	4
Scholastic achievement	0	3	35	56	3	3
Suitability as a potential physician	7	36	43	9	2	3
Scholastic potential	0	9	51	33	3	4
Comparison of applicant with other applicants or with medical students from the same premedical college	2	8	36	46	5	3
Weaknesses and compensations, if any	2	13	48	26	4	7
Over-all rating (highly recommended, recommended with reservations, not recommended)	1	5	44	44	2	4
Other	0	0	1	1	*	98

*Less than 1 per cent response.

TABLE A.12

COMMITTEE ESTIMATES OF VALUE OF ESSAY AND/OR AUTOBIOGRAPHY IN APPRAISING APPLICANTS

(Committee members group)

Appraisal from essay and/or autobiography	% of 371 members citing value of essay and/or autobiography*				
	None	Little	Some	Much	No response
Indication of applicant's proficiency in English composition and grammar	1	5	41	45	8
Indication of sincerity of applicant	4	33	36	19	8
Check on motivation of applicant	5	42	35	10	8
Appraisal of applicant's handwriting	16	29	33	14	8
To help in the detection of abnormal personalities	6	23	46	16	9
To yield information for use in subsequent interviews with applicant	10	18	43	19	10
Other	1	0	1	3	95

*Of the 534 committee members, this 69 per cent said they used the essay and/or autobiography in appraising applicants.

TABLE A.13

SIGNIFICANCE OF CRITERIA FOR ASSESSMENT FOR SCHOOLS THAT HAVE AND HAVE NOT ATTEMPTED TO ASSESS SUCCESS IN OBTAINING HIGH-QUALITY APPLICANTS

(Participants group)

Criteria for determining quality of applicant groups	Significance of criteria cited by % of 74 schools that have attempted assessment					Significance of criteria cited by % of 17 schools that have not attempted assessment				
	None	Little	Some	Much	No response	None	Little	Some	Much	No response
Undergraduate colleges of origin	0	1	45	54	0	0	12	23	53	12
Years of college preparation	0	14	54	32	0	0	12	59	17	12
College grade-point average	0	0	27	73	0	0	0	12	76	12
Preprofessional recommendations	1	11	49	38	1	0	29	35	24	12
MCAT scores	1	8	58	31	2	0	6	47	29	18
Other	0	0	3	4	93	0	0	0	12	88

TABLE A.14

SIGNIFICANCE OF CRITERIA FOR EVALUATING SUCCESS IN ENROLLING DESIRABLE APPLICANTS FOR SCHOOLS THAT HAVE AND HAVE NOT ATTEMPTED TO MEASURE ENROLLMENT PROGRAM SUCCESS

(Participants group)

Criteria for evaluating success	Significance of criteria cited by % of 59 schools that have attempted to evaluate success*					Significance of criteria cited by % of 30 schools that have not attempted to evaluate success*				
	None	Little	Some	Much	No response	None	Little	Some	Much	No response
A. Study of characteristics of enrolled groups in regard to:										
1. Undergraduate colleges of origin	3	5	48	41	3	0	7	7	3	83
2. Years of college preparation	0	15	63	19	3	0	7	10	0	83
3. College grade-point average	0	0	27	70	3	0	3	7	7	83
4. Preprofessional recommendation	2	20	53	22	3	0	7	10	0	83
5. MCAT scores	2	12	52	29	5	0	7	10	0	83
6. Other	0	0	3	5	92	0	0	0	0	100
B. Comparative studies of these characteristics among enrolled vs applicant groups	22	5	44	19	10	3	0	3	0	94
C. Proportion of applicants who, when accepted by you, matriculate at your school	7	12	44	32	5	0	0	7	7	86
D. Proportion of admitted students who graduate from medical school	3	5	22	66	4	0	0	0	17	83
E. Grades attained in medical school	2	10	39	46	3	0	0	10	7	83
F. Personal evaluation of students by instructors in medical school	3	5	27	61	4	3	0	3	10	84
G. Other	0	0	2	5	93	0	0	0	0	100

*Of the 91 schools, 2 did not respond to the question on attempts to measure the success of their enrollment programs.

2. The Interview and Other Appraisal of Nonintellectual Characteristics

TABLE A.15

EXTENT OF OUTSIDE ASSISTANCE IN INTERPRETATION OF PERSONALITY AND INTEREST TESTS

(Participants group)

Response	% of 91 schools
Yes	20
No	13
Do not use such tests	67

TABLE A.16

SOURCES OF INFORMATION ON MENTAL HEALTH OF APPLICANTS

(Participants group)

Source of information on mental health	% of 91 schools citing extent of use of source					
	Not obtained	None	Little	Some	Much	No response
Appropriate questions on application form	41	6	14	25	12	2
Personal interview	4	0	6	38	51	1
Psychiatric interview	38	1	23	20	14	4
Written essay by applicant	48	0	9	33	3	7
Physician's report (non-psychiatric)	43	2	9	24	16	6
Psychological screening test	74	4	4	4	6	8
Other	1	0	0	4	6	89

TABLE A.17

PROPORTION OF APPLICANTS INTERVIEWED IN RELATION TO SIZE OF 1956 APPLICANT GROUP

(Participants group)

Proportion of applicants interviewed	% of 91 schools citing size of applicant group			% of 91 schools citing proportion of interviews
	250 or less	251 - 1000	Over 1000	
0 - 25%	0	10	8	18
26 - 50%	1	13	10	24
51 - 75%	8	11	4	23
76 - 99%	8	5	7	20
100%	2	11	0	13
No response	1	1	0	2
Total	20	51	29	100

TABLE A.18

AVERAGE NUMBER OF INTERVIEWS PER APPLICANT TO 1956 MEDICAL FRESHMAN CLASS

(Participants group)

Type of interview	Number of schools	Mean number conducted per applicant
On-campus interviews	87	1.94
Off-campus interviews	26	1.32
Total interviews conducted both on and off campus	89	2.27

TABLE A.19

METHODS USED FOR REPORTING INTERVIEWS TO THE ADMISSIONS COMMITTEE

(Participants group; multiple response)

Interview reporting method	% of 91 schools
Oral report	26
Informal written report, general remarks or appraisal only	54
Formal written report, replying to specific questions	29
Other type of report	9
No report required	2
Participants who did not check any of the above methods	3

TABLE A.20

VERBATIM RECORDING OF INTERVIEWS

(Participants group)

Interview recording	% of 91 schools
Always verbatim	1
Frequently verbatim	0
Sometimes verbatim	12
Never verbatim	85
No response	2

TABLE A.21

OPINION ON POTENTIAL ADVANTAGE OF INTERVIEW TO STUDENT IN RELATION TO EXTENT OF USE OF INTERVIEW

(Participants group)

Potential advantage of interview	Evaluation by % of 65 schools using interview much					Evaluation by % of 26 schools using interview some, little, or not at all				
	No value	Little value	Some value	Much value	No response	No value	Little value	Some value	Much value	No response
It may afford him an opportunity to inspect the academic and non-academic facilities of the medical school	1	14	51	34	0	0	31	38	27	4
It permits him to question the interviewer regarding details concerning the medical school	0	5	43	52	0	0	12	42	42	4
It allows him an opportunity to explain in person any unique aspects of his application	0	1	31	68	0	0	4	38	54	4
It affords him an opportunity for a personal acquaintance with someone at the medical school	1	17	45	37	0	12	19	38	27	4
Other	0	0	5	6	89	0	0	8	4	88

TABLE A.22

OPINION ON POTENTIAL ADVANTAGE OF INTERVIEW TO SCHOOL IN RELATION TO EXTENT OF USE OF INTERVIEW

(Participants group)

Potential advantage of interview	Evaluation by % of 65 schools using interview much					Evaluation by % of 26 schools using interview some, little, or not at all				
	No value	Little value	Some value	Much value	No response	No value	Little value	Some value	Much value	No response
It allows the admissions committee an opportunity to verify and clarify information obtained about the applicant	0	0	23	77	0	0	4	58	34	4
It permits the committee to ascertain whether the candidate possesses any obvious physical or mental handicaps (speech impediment, tics, etc.)	0	0	17	83	0	0	4	23	69	4
It affords the interviewer an opportunity to delve into an applicant's motivation for the study of medicine	0	9	45	46	0	4	38	31	23	4
It gives the interviewer an opportunity to give the applicant detailed information about the medical school	3	23	54	20	0	11	27	27	31	4
It allows a first-hand evaluation of the applicant's intellectual abilities	0	18	60	22	0	8	34	50	4	4
It permits an evaluation of the applicant's cultural breadth	0	11	55	34	0	0	19	62	15	4
It affords an opportunity to assess the applicant's ability to withstand stress	8	37	37	17	1	8	30	54	4	4
It permits observation of the applicant (poise, frankness, bearing, etc.)	0	0	23	77	0	0	0	54	42	4
It permits an assessment of the skill of the applicant in interpersonal relationships	0	9	57	34	0	12	11	69	4	4
Other	0	0	3	2	95	0	0	0	8	92

TABLE A.23

NUMBER OF INTERVIEWERS PARTICIPATING IN SELECTION OF 1956 MEDICAL FRESHMEN

(Participants group)

Number of interviewers	% of 91 schools
5 or fewer	22
6 - 10	33
11 - 20	21
21 - 50	18
Over 50	4
No response	2

TABLE A.24

DISTRIBUTION OF INTERVIEWERS ACCORDING TO THEIR PRESENT POSITION AT THE MEDICAL SCHOOL

(Participants group)

Present position of interviewers	% of 91 schools citing proportion of interviewers in each position						
	None listed	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%	No response
Medical school faculty members	0	3	7	4	6	78	2
Nonmedical school faculty members (e.g., staff member from parent university)	88	7	1	2	0	0	2
Nonfaculty alumni	70	17	7	1	2	1	2
Former staff members	88	7	3	0	0	0	2
Other	76	16	3	1	1	0	3

TABLE A.25

INTERVIEWER FAMILIARITY WITH APPLICANT'S FILE AT TIME OF INTERVIEW

(Participants group)

Interviewer familiarity with applicant's file	% of 91 schools
Always	33
Usually	32
Sometimes	15
Rarely or never	18
No response	2

TABLE A.26

ADMISSIONS COMMITTEE INSTRUCTIONS ON INTERVIEW CONTENT

(Participants group)

Instructions on interview content	% of 91 schools
Yes	38
No	58
No response	4

TABLE A.27

STUDENT CHARACTERISTICS OBSERVED IN INTERVIEW

(Participants group; multiple response)

Characteristics observed	% of 32 schools*
Manner	97
Poise	94
Fluency of speech	100
Dress	75
Physical appearance	94
Other	47

*Of the 91 participants, 32 stated specific instructions on content were issued to the interviewers at their schools.

TABLE A.28

TOPICS COMMONLY COVERED IN INTERVIEW

(Participants group; multiple response)

Interview topics	% of 32 schools*
Motives for wishing to study medicine	100
Early development of applicant	62
Ability of applicant to withstand stress	69
Knowledge of current events	75
Cultural interests	94
Specific scientific interests	97
Mental health	69
Physical health	88
Other	59

*Of the 91 participants, 32 stated specific instructions on content were issued to the interviewers at their schools.

TABLE A.29

APPLICANT APPRAISAL BY THE INTERVIEWER

(Participants group)

Appraisal made solely by interviewer	% of 91 schools
Yes	34
No	54
Not applicable	7
No response	5

TABLE A.30

FINAL APPRAISAL OF APPLICANT MADE ON BASIS OF COMMITTEE REVIEW OF INTERVIEW REPORT

(Participants group)

Response on final appraisal	% of 49 schools*
Committee review of interview report final	96
Committee review of interview report not final	2
Not applicable	2

*Of the 91 participants, 49 indicated that at their schools the interviewer did not make the sole appraisal of the interviewed applicant.

TABLE A.31

ADDITIONAL INFORMATION ON EXTRA-CURRICULAR ACTIVITIES
(Medical freshmen group)

Number of activities and offices	% of 756 freshmen citing	
	Activities	Offices held*
None	4	41
One	11	22
Two	14	13
Three	19	8
Four	17	4
Five	11	3
Six	9	1
Seven	5	†
Eight	3	†
Nine or more	3	†
No response	4	8

*Of the 756 medical freshmen, 24 per cent stated they had been heads of organizations.
†Less than 1 per cent response.

TABLE A.32

NUMBER OF SCHOOLS INTERVIEWING 1956 MEDICAL FRESHMEN
(Medical freshmen group)

Number of schools at which applicant was interviewed	% of 756 freshmen
None	7
One	39
Two	24
Three	13
Four	7
Five	4
Six	2
Seven	1
Eight	1
Nine or more	1
No response	1

TABLE A.33

NUMBER OF SCHOOLS GIVING PSYCHIATRIC INTERVIEW TO 1956 MEDICAL FRESHMEN
(Medical freshmen group)

Number of schools at which applicant received psychiatric interview	% of 756 freshmen
None	60
One	13
Two	2
Three	1
Don't know	23
No response	1

TABLE A.34

STUDENT COMMENTS ON OPINION OF PSYCHIATRIC INTERVIEW*
(Medical freshmen group)

Reason for opinion	Frequency
Enthusiastic opinion	
Better qualified to pick capable students	49
Psychological factors are important	25
Allow only stable-mature students to study medicine	22
Evaluate applicant's motivation	6
Miscellaneous	19
Favorable opinion	
Better able to assess applicant—more insight	139
Screen unstable candidates	55
Psychological factors are important	35
Therapeutic effect	23
Discover hidden deficiencies	19
Determine motivation	17
Helpful if used with other interviews	9
Less emphasis on scholarship	6
Depends on the psychiatrist	6
Miscellaneous	32
Indifferent opinion	
Short, tense, single interview will tell little	55
No better than any interviewer	40
Student knows little about values of psychiatric interview	25
Makes applicant tense	4
Old standards good—why change	3
Depends on psychiatrist	3
Miscellaneous	40
Opposed opinion	
Psychiatrist unsuitable	14
Psychiatrist has emotional effect on student	14
Too inaccurate	13
Sees student at time of tension—couldn't evaluate—too short a time	12
Unnecessary	9
Miscellaneous	12
Strongly opposed opinion	
Can't evaluate in one interview—chance appraisal	3
Caused student to be tense	2
Miscellaneous	3

*See Table 8.24 in Chapter 8.

TABLE A.35

STUDENT REPORTS ON USE OF PSYCHOLOGICAL TESTS OTHER THAN MCAT
(Medical freshmen group)

Response	% of 756 freshmen
Other tests taken	21
Other tests not taken	64
Don't know if other tests taken	15

TABLE A.36

REGION OF MEDICAL SCHOOL VS. ANXIETY RATING
(Medical freshmen group)

Region	N	% of freshmen in each region citing own anxiety in relation to that of other applicants			
		Much more	More	Average	Less
Northeast	(216)	6	20	51	23
South	(252)	9	24	57	10
Midwest	(224)	6	17	56	21
West	(58)	5	17	61	17
Other	(6)	17	33	33	17
Total	(756)	7	20	55	18
			$\chi^2 = 20.1960^*$	$p < .001$	

*For purposes of Chi-square analysis, the categories "Much more" and "More" were combined and "Other" and "No response" excluded since expected cell frequencies were too small for the test to yield accurate probability values. The Chi-square which results, therefore, has 6 degrees of freedom.

TABLE A.37

STUDENT COMMENTS ON SPECIAL PROBLEMS CONCERNING ADMISSION PROCEDURES
(Medical freshmen group; multiple response)

Comments	Frequency
Negative comments	
Individual interview of questionable validity	50
Disassociation between med and premed school causes confusion	49
Insufficient attention paid to nonacademic factors; overemphasis on grades.	44
Need earlier notification of acceptance or rejection	27
MCAT is of questionable validity	19
Too little information from medical school on who are admissions personnel, what are chances of acceptance, and what methods of selection are used	18
A nationwide acceptance date is needed	15
Need less stress on science courses and more on liberal arts in premed	15
There is religious, racial, and regional discrimination by medical school	14
Medical school should explicitly state reason for rejection	11
Financial aid and information about it is inadequate	11
Not all schools grant interview to every applicant	10
Premed counseling program is inadequate	8
Professor's recommendations are biased and over-emphasized	8
Application procedure is costly and time-consuming	8
Influence is needed to get into the better medical schools	8
Interviews should be held at main universities in U.S.	7
Group interview has questionable validity	6
The interview is given insufficient weight	6
Traveling for interview involves inconvenience and expense	5
Application should receive MCAT scores	5
Excessive competition in premed course	4
Admissions committee does not sufficiently evaluate premed school	3
Miscellaneous comments, including highly personal ones (e.g., "Professor X is an S.O.B.")	44
Total negative comments	411
Positive comments	
Application procedure was handled well	17
Interview was thorough	3
MCAT is useful for selection	2
Other positive comments	1
Total positive comments	23
Uninterpretable comments	19
Total number of comments:	453 from 320 students

Selected comments

"It seems it would be a great aid to the premed if there was a nationwide acceptance date."

"If it is possible, it would be good if all schools would admit students at the same time. I also think that applicants who do poorly on the MCAT the first time should be given a chance to retake it. Also if possible scholarships should be awarded before the January 15 deadline so as to make choices easier."

"Earlier date of XXX's scholarship award announcements would be most helpful. I suspect that part of the reason for nonadmission to some schools was the fact that I stated I could not possibly attend without at least $500 aid. Had awards been announced earlier, it might have helped."

"I think XXX's plan of not requiring a money deposit upon acceptance is one of great merit. It happened that I was accepted there first and had to accept that before accepting at ZZZ. This happened as I was on the ZZZ waiting list and did not get accepted until late. Besides appreciating the fact that I did not lose any money in changing schools, I appreciated the attitude expressed by XXX that no amount of money should keep one from going where he wanted."

"I think that the influence of the MCAT in choosing prospective students should be standardized by all the medical schools. Once its influence had been standardized, it should not be considered with much importance."

"I believe that medical school admissions

should be on the same matching-card system as (I am informed) exists for internships."

"Catalogs of medical schools are terrible. They should be better organized and contain more details of the curriculum. More pictures and less listings of students and profs would be desirable. I am in complete disagreement with the practice of only giving the applicant two weeks to accept while he may have had to wait several months before the school had decided to accept him."

"I recommend every medical school increase its amount of printed material available to the student *before* he must choose to apply. Personal interviews and contacts are extremely stimulating and helpful—I suggest these be emphasized as much as possible. A little lack of enthusiasm in some interviewers might be practical (this is in no way a complaint against interviewers with whom I dealt.) I wish that the immediate reaction of the public as a whole was not so immediately enthusiastic to medical students, blindly, because I fear this destroys the prospective student's realistic outlook."

"I think women should be given more opportunities to enter a medical school. They should be considered on the same basis as men. Women doctors have some advantage over men especially in the fields of pediatrics and gynecology, especially if they are mothers. Also they can make valuable contributions to medical service, specially during war emergencies when men doctors are recruited to serve."

"In my particular case I was married and had a two-year-old daughter when I returned to school after an absence of six years. Therefore, time was a vital factor and I felt that too many schools required a degree regardless of type for admission. This was the reason I applied to XXX for I knew that my case would be weighed on its merits rather than on its conformity since a degree is not required here as is at ZZZ. Although many schools indicate that they accept three-year students, many do so only under an Arts-Medicine set-up. In my case, it required less time to obtain a degree than to qualify as an Arts-Medicine applicant. Due to the fact that many schools rely practically on grades, I have seen students cheat on exams, purchase products (finished) for laboratory turn-ins, and sometimes secure final exams in advance—all in order to score highly and therefore receive an excellent mark in the course."

"It is my observation at the college I attended that some of the principal science professors seemed to decide early in the undergraduate years of the student which ones were capable of becoming good doctors and which ones were not. There then followed, it seemed to many of us, overcritical advice and grading to steer the student out of the field or continue him on his way. It seems to me that although a little of this is necessary, it is taking away a good deal of the necessary service and purpose of the medical school admissions board."

"I was a student whose interest and aptitude were rated high by the MCAT and various other tests. However, my grades were not as high as required, I feel because I could not adjust to the competitive pressures of premed life. I was placed on the alternate list and am in medical school today more or less by luck. I feel this is wrong, not because it happened to me, for I needn't worry about acceptance now, but because it will happen to others in the future. I believe that medical schools should inquire into the motives of an applicant, why he wants to study medicine, into his moral standards to find out what kind of a doctor this man will be, and then into his grades. I feel medical schools should be interested in turning out doctors, in the fullest sense of the word, rather than scholars in medical sciences."

"I sincerely feel that a great deal of benefit would be derived from a thorough study of the premed 'required' curriculum. The number of required courses by certain state institutions seems to be needlessly excessive. In many institutions integrated programs of natural science are open to students not interested in pursuing occupations which require scientific background. It is a well-known fact that the medical student makes very little use of many of the facts learned in premedical courses. Thus it would seem possible to investigate the possibility of establishing an integrated program of scientific study for the premed. This could be an interdepartmental effort on the part of the faculty and could cover all needed facts and laboratory technique, and eliminate much unnecessary work. For the premed who is very much interested in science the more advanced courses in each department would still be available, and it would be unnecessary for him to take the more elementary integrated program. This would seem to be a step in the direction of solving the problem for those premeds who are not science majors, and also allow more latitude in the general premed program."

"I had some difficulty in obtaining the recommendation of my instructors. Many were courses in my freshman year and I had lost contact with the instructors."

"I think the AAMC questionnaire is fine."

APPENDIX B – Bibliography*

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SAMUELD, H. The validity of personality-trait ratings based on projective techniques. *Psychol. Monog.*, 1952, 66, (8) No. 337. 21 pp.
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Tests

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IV. Over-all Appraisal of the Admissions Process

ADMISSION PROCEDURE AND THE STUDENT

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The first of a series of proceedings of CEEB-sponsored annual colloquia on college admissions. Papers contributed by college admissions officers.

——*Freshman Admissions Forms and Letters.* New York: Coll. Entr. Exam. Bd., 1954. 347 pp. Sets of forms and letters used by a variety of CEEB colleges.

COUNCIL ON SOCIAL WORK EDUCATION, INC. *Selection of Students for Schools of Social Work.* New York: Coun. Soc. Work Educ., 1955. 84 pp.
Summary of national workshop on admissions, with follow-up report of progress in implementation, revealing problems parallel with those in selection of medical students.

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Myths current among premedical students concerning medical school admissions policies. Discussion of qualities sought by admissions committees in applicants. Presents admission statistics of the Harvard Medical School.

SEVERINGHAUS, A. E., Carman, H. J., and Cadbury, W. E., *Preparation for Medical Education in the Liberal Arts College.* New York: McGraw-Hill, 1953. 400 pp.
Report of a survey to discover the "contributions the liberal arts colleges were making toward the total education of the future professional man, particularly the student who was looking forward to a career in medicine." Discussion of all aspects of premedical education, including the student, advisory system, teachers, curriculum, etc.

Test

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METHODS AND GOALS OF SELECTION

BUROS, O. K. *The Fourth Mental Measurements Yearbook.* New Jersey: Gryphon Press, 1953.
Exhaustive treatment of all psychological tests in existence at time of writing, including description of test, uses, research conducted with it. Covers tests of aptitude, achievement, attitudes, personality. Indices of authors, of tests alphabetized by name, and of tests classified by type.

DARLEY, J. G. *The Use of Tests in College, Amer. Coun. Educ. Studies,* Series 6, No. 9, 1947.
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HURD, A. W. *Problems of Collegiate Success or Failure with Particular Reference to Professional Schools of Medicine.* Richmond, Va.: Med. Coll. of Va., 1949.
Description of studies of medical curricula. Investigation of the relation between medical school success and such variables as achievement scores, marital status, veteran status, and sociological background.

KELLY, E. L. AND FISKE, D. W., *The Prediction of Performance in Clinical Psychology.* Ann Arbor, Mich.; Univ. of Mich. Press, 1951. N. B. summary and discussion.
Evaluation of an extensive program of assessing entering graduate students in clinical psychology. Assessment procedures included a wide variety of objective, projective, and situational tests, as well as psychiatric interviews, and several methods of combining information about each student in order to predict his later success in graduate training.

LINDQUIST, E. F. (ed.) *Educational Measurement.* Washington: American Council on Education, 1951, 820 pp.
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LUBORSKY, L. B., HOLT, R. R., and MORROW, V. R. Interim report of the research project on the selection of medical men for psychiatric training. *Bull. Menninger Clin.*, 1950, 14, 92-101.
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STUIT, D. B. Counseling methods: diagnostics. In C. P. Stone (Ed.), *Ann. Rev. Psychol.* Vol. 2. Stanford, Calif.: Annual Reviews, 1951.
Survey of the literature, 1949-1950, of measures of aptitude, achievement, interest, and personality. Also includes sections on questionnaires, check lists, projective techniques, and the interview.

STUIT, D. B., DICKSON, G. S., JORDAN, T. F., AND SCHLOERB, L. J., *Predicting Success in Professional Schools*, Washington, D. C.: Amer. Coun. Educ., 1949. 187 pp.
General problems and techniques in predicting success. Review studies of prediction of professional school success—using preprofessional records, aptitude tests, personality tests, etc.—in the fields of engineering, law, medicine, dentistry, music, agriculture, teaching, and nursing.

SUPER, D. E. *Appraising Vocational Fitness.* New York: Harper, 1949. Comprehensive text on testing in vocational guidance and selection.

THORNDIKE, R. L. *Personnel Selection: Test and Measurement Techniques.* New York: Wiley, 1949, 358 pp.
A critical study of the techniques necessary to a successful program of personnel selection. Tells how to develop good tests, how to apply them efficiently, and how to interpret them accurately. Emphasis is placed on the logic behind testing methods.

THORNDIKE, R. L., AND HAGEN, E. *Measurement and Evaluation in Psychology and Education.* New York: Wiley, 1955. 575 pp.
Textbook on testing and measurements, including explanations of the basic concepts of selection tests, material on evaluation of such tests, descriptions of standard tests.

TRAVERS, R. M. W. An inquiry into the problems of predicting achievement. *USAF Personnel Train. Res. Cent., Res. Bull.*, 1954, AFPTRC-TR-54-93. iii, 32 pp.
Defines in "more precise terms than are commonly used, the nature of the prediction problem which those engaged in aptitude measurement attempt to solve." Advocates greater use of stimulus-response theory, and a more theoretical approach.

APPENDIX C—Summary of Ongoing and Recent Research in Interest and Personality Measurement in United States Medical Schools

As reported to

OFFICE OF THE DIRECTOR OF RESEARCH, AAMC

December 1956

AAMC Central Office Research Section

1. The *Allport-Vernon-Lindzey Study of Values, Edwards Personal Preference Schedule* (PPS), and *Strong Vocational Interest Blank* have been administered to freshman and senior medical students in stratified samples of medical schools throughout the United States. Studies in progress include the following:
   a. With the Carnegie Institute of Higher Education, a study of the diversity of characteristics of students in medicine. Personality characteristics, interests, and values are being studied in the following contexts: student choices of type of career and specialty in medicine; intellectual ability and biographical data characteristics; undergraduate college origins; and geographical region, type of financial support, and intellectual level (as indicated by average student MCAT scores) of medical schools.
   b. Cross-sectional and longitudinal studies of changes in interest and personality characteristics from freshman to senior year in medical school and beyond.
   c. Achievement prediction studies.
   d. Dynamics and permanence of specialty and type-of-career choices.
   e. Methodological studies of such problems as methods of combining data for purposes of prediction, methods of keying the Edwards PPS, falsification of response under the stress of applicant status, and differential prediction of achievement for students of high and low ability.
2. With Pollock and Yufit at the University of Illinois, a study of interrelationships among the Stern, Stein, and Bloom *Activities Index*, the Edwards PPS, and Social Desirability Scale scores.
3. A study of personality characteristics of successful and unsuccessful applicants for entrance to medical school.

Albany

Third-year students are under study to determine:

1. Personality factors conductive to the development of an empathic, humanistic grasp of medical practice.
2. The relationships between grades and attitudinal development.
3. The effect of a family-care training program on student anxiety and feelings of adequacy.

The study employs two types of projective instruments—the Sentence Completion Test and the Sick Room Situation Test (5).*

Arkansas

The following studies are underway:

1. Comparison of MMPI scores before and after admission to medical school.
2. An examination of relationships between personal value systems and effectiveness in senior year psychiatric clerkships, utilizing the Allport-Vernon-Lindzey *Study of Values* and specially constructed rating scales.
3. Comparison of the intellectual and personality characteristics of students who withdraw from medical school as against those who obtain the M.D. degree.

*Note that the numbers in parentheses refer to the alphabetical list of references following this summary.

University of Chicago

Although the data from the studies described below bear only indirectly on motivational research, they reveal some of the goals and satisfactions of the medical respondents and the subjects' impression of medical practice.

1. In 1947 the National Opinion Research Center (10) conducted an exploratory survey among 194 interns in a 34-hospital random sample of American hospitals to determine their knowledge of and attitudes toward civilian medical practice, their knowledge of and attitudes toward the United States Army Medical Corps, and their plans and expectations. The only instrument employed was a questionnaire prepared especially for this study.
2. In 1948, again with the use of a questionnaire, the National Opinion Research Center (11) interviewed 2,271 medical students, practicing physicians, interns, and residents to determine their reactions to the establishment of an Air Force Medical Service. The samples were national in scope and as representative as possible, within certain eligibility requirements with respect to military service.
3. In 1956, the National Opinion Research Center interviewed 1,086 medical students in 44 medical schools (constituting a probability sample of all medical students in the country) for the purpose of determining career motivations and plans.

Colorado

1. All available information about applicants is being punched into cards, and this record will be continued for those applicants that are accepted. The recorded data will include a summary of ratings of fifteen personality characteristics on five-point scales by two interviewers.
2. A psychological testing service that will make available more evaluation tools is in the planning stage.

Columbia

Projects are underway at the Bureau of Applied Social Research to study the "social and psychological environment comprised by the medical school, and the bearing of that environment on the acquisition of knowledge and skills, attitudes and values by medical students . . ." (8) All medical students at Cornell, Pennsylvania, and Western Reserve are serving as subjects. They are being studied by means of questionnaires and other qualitative materials.

Cornell

The staff of the Comprehensive Care and Teaching Program is carrying on an evaluation of the effect of a course in comprehensive medicine on students' attitudes and abilities (12). This study is being pursued in part in collaboration with a group of social scientists at the Bureau of Applied Social Research of Columbia University who have devised an attitude questionnaire and, in addition, employed various qualitative measures to determine attitudes of students and their relation to the whole Cornell medical curriculum.

Harvard

Dr. Samuel Bojar has underway a study of conscious and unconscious motivation for becoming a physician. A psychiatric interview with each first-year medical student, on which the study is based, has been incorporated as a routine part of the physical examination made as he enters the medical school. These interviews provide material for the motivational study, and also for a study of the socioeconomic background of the students. The motivational and background factors will later be analyzed in relation to achievement level as medical students and as physicians.

Iowa

1. In a study of interviewer reliability, thirteen personal characteristics of each applicant, as well as his over-all fitness for medicine, are rated on five-point scales independently by two interviewers (16).

2. W. W. Morris is studying a method for correcting individual interviewers' systematic biases in rating applicants—strict, easy, or in-between. By knowing how an interviewer compares with other interviewers in the strictness of his judgments, a standard score system can be devised to make interviewers' ratings comparable.
3. A Ph.D. dissertation by Mohr studied the relationship between performance on special-ability tasks and (a) success, neutral, and failure instructions; (b) presence or absence of a prestige figure at the test sessions; (c) four special abilities (span, word fluency, induction, and speed of closure); and (d) *Taylor Anxiety* scores (9). The several findings included an inverse relationship between levels of anxiety and frequency scores on the span and reasoning tests.
4. The *Thurstone Temperament Schedule*. Several Thurstone-type objective tests of temperament, and a forced-choice anxiety scale were administered to the 1953 freshman class. Morris is factor-analyzing intercorrelations among the various tests. He is further exploring the relationships among the tests and between the forced-choice anxiety scale and medical school success.
5. Results from administration of the *McClelland Need-Achievement Test* to the 1953 freshman class are being studied by Morris in relation to premedical grades, MCAT scores, and success in medical school.
6. Morris is investigating the distribution of liberal arts courses taken in preparation for medical school and the relationship between success in medical school and emphasis on science in the premedical curriculum.
7. A study by Morris, currently in the design stage, will probe the relationship between communication skills and success in medical school.

Johns Hopkins

1. An intensive study by Whitehorn and Betz employing 100 patients and fourteen psychiatrists was undertaken to investigate the correlation between types of psychiatrist-patient relationships and frequency of patient's recovery (17). Patient improvement was found related to the form of the diagnosis, the psychiatrist's strategic goals in therapy, the type of tactical pattern followed by the psychiatrist, and the degree to which the patient developed a confidential relationship with the psychiatrist.
2. Early results of an investigation still in progress suggest the existence of a correlation between certain categories of professional performance and a special screen of scores on the *Strong Vocational Interest Blank*.

Marquette

1. A large group of medical freshmen and an equivalent group of medical applicants were compared with respect to scores on three mental ability tests and two personality tests. No differences appeared.
2. It is proposed to determine, after the graduation of present students whose test scores are available, what characteristics are related to successful medical practice. The opinions of medical colleagues will supplant the usual medical school grades as the criterion of medical success. The sample for this study consists of several freshman classes of about 100 students each. The tests used include the *American Council on Education Psychological Examination, Cattell's Culture Free Test of G, Miller Analogies Test, Minnesota Paper Form Board, Strong, MMPI, Cattell's 16 PF (Personality Factors) Test*, and the *Allport-Vernon-Lindzey Study of Values*.

Michigan

1. A study of the class that graduated in 1952 is in progress. Data already collected include *Strong* scores, sociometric test results, autobiographical material, application material, instructors' comments, medical school grades, and reports from hospitals in which these students served as interns.

2. The study may be extended to the class of 1955, which took the *Strong*. Sociometric test data have been obtained from the class of 1956. The *Strong* and *McQuitty Health Questionnaires 46 and 47* (an adjustment inventory) were administered in 1952 to all four medical school classes enrolled at that time.
3. A proposal has been made to study all available information concerning students who have withdrawn from medical school.

Minnesota

1. The MMPI has been administered to large groups of medical students in a series of three studies by Schofield (13, 14, 15). The first study was concerned with obtaining normative data and comparing medical school juniors with late premedical and general college populations. The second study investigated changes in MMPI profiles of medical students between the freshman and junior years. The third study investigated the relationship between success in medical school and (a) MMPI profile in the freshman year, (b) MMPI profile in the junior year, and (c) change in MMPI profile from freshman to junior year.
2. Melton has investigated the relationships between first-quarter freshman premedical honor-point ratios on the one hand and *Strong, Cooperative English, Ohio Psychological,* and *American Council on Education Psychological Examination* scores on the other (6).
3. Hewer undertook a study of the relation of the medical school success-failure variable to high school rank, total premedical honor point ratio, and scores on the following: *American Council on Education Psychological Examination; Cooperative English Test; Professional Aptitude Test* (precursor of MCAT), including sections on verbal ability, quantitative ability, modern society, and medical science; *Minnesota Medical Aptitude Test, Strong,* and MMPI (4).

Northwestern

1. A study is being planned to obtain some understanding of students' feelings of aggression provoked by the pressure to which students are exposed.
2. Students' attitudes toward courses, amount of time spent in study, need for leisure time, etc., have been investigated by means of questionnaires.
3. G. K. Yacorzynski and John A. D. Cooper have submitted a proposal to study alternative medical curricula which would conform better with the declining powers of rote memory, growing ability to see relationships, and emotional and intellectual maturation of the developing student.

Pittsburgh

1. A systematic study of grades in each subject of instruction and of the relationships among grades has been undertaken, with resulting normative information. A proposal has been advanced for a new grading system which ensures comparability of grades in all subjects with regard to means and distributions, yet permits variable rates of failure from year to year. An observational rating form and an objective measure of diagnostic skill (Rimoldi) are being used to measure the adequacy of work of third and fourth year students in clerkship and clinic. Also planned are measures of students' observational skills and interpersonal relationships with patients.
2. A biographical survey of 80 five-choice items has been administered to two successive entering classes. Normative data for these classes are available, as well as comparisons with dental and pharmacy student data. A program of item analysis is planned, and the more valid items may then be incorporated into selection and guidance procedures.
3. Admissions interviews for two successive entering classes have been reported by interviewers on a report form that includes, among other things, an unstructured observational report and a prediction as to probable class standing of each candidate. Validity and reliability of these reports will be investigated.

4. A six-page application blank in use for the past two years will be validated against the success-failure criterion, and will be changed accordingly to maximize its effectiveness in predicting success in medical school.
5. Normative studies of all classes entering in 1953 through 1956 have yielded information about such characteristics as educational record and background, veteran status, sex, geographical residence, and MCAT score. All available admissions data for the 1955 and 1956 entering classes are being subjected to intercorrelational and cross-validational analysis.

State University of New York, NYC

1. The *Machover Figure Drawing Test* has been administered for over six years to all interviewed applicants. The results of this testing are currently being analyzed by Faterson (3).
2. This year all interviewed applicants are taking the *Witkin Embedded Figures Test.*
3. It is proposed to investigate correlations among students' admissions scores (numerical designations of applicants' qualification), MCAT scores, interviewers' evaluations, premedical colleges' evaluations, and medical school performance.

State University of New York, Syracuse

1. Much data concerning several medical school classes have been collected in recent years, chiefly by D. G. Johnson and associates. *Strong* scores and essays have been collected as admissions data from the 1953 and 1954 freshmen. Essays were collected in the same way from the 1955 freshman class and interview data involving fourteen factors were taken from the freshmen entering in 1956. Registration data have been collected as follows: *Strong, Rorschach, Thematic Apperception,* and *Figure-Drawing Tests* from the 1953 freshmen: *Strong, Guilford-Zimmerman,* and *Activities Index* data from the 1954 freshmen; and *Strong* and *Activities Index* data from the 1955 freshmen.
2. Samson and Westerfield investigated class ranks of students in the 1949 freshman class as related to the time of their acceptance. The same class was also used for a study of failures and for the collection of sociometric data at graduation.
3. Stern has submitted a proposal for the study of nonacademic factors in medical school achievement.
4. Wexler has made extensive follow-up studies of the freshman classes of '48 and '49, including the relationship between nonacademic factors and academic performance.

Texas

A group of 160 students has been tested with the *Wechsler-Bellevue* and seven other tests: *Rorschach, Szondi, Most Unpleasant Concept, Figure-Drawing Test,* graphic techniques (part of the *Thematic Apperception Test*), and the *Sentence-Completion Test.* The results are being compiled and analyzed by M. R. Harrower to detect students in need of therapy or counseling and to improve prediction of performance over the prediction possible with tests of ability alone.

Tulane

Intensive therapy has been given since 1954 to more than 20 students a year. At the present time 67 students have received intensive treatment. This gives a unique opportunity to study in depth the problems of adaptation to medical school. Psychological studies including projective techniques have been carried on simultaneously. Psychiatric data for the 15 lowest- and 15 highest-standing students in each of three sophomore classes, and continuing for the three remaining years, will be analyzed with emphasis on discovering the psychodynamic factors involved in the medical students' adaptation to medical school and the learning process.

Utah

Increasing interest in studying the makeup of and differences among medical students

began with research on the differential effect of a Family Medical Guidance Program as part of an attempt to understand the general educational influence of such a program. The nursing school has recently been added as a control. An annual testing consists of cognitive, attitudinal, and personality measures. Most of the attitudinal measures as well as some of the personality tests have been specially developed. Among the standard instruments used are the *Strong, Allport-Vernon-Lindzey Study of Values,* factored intelligence tests, *Rorschach, Figure Drawing, Blacky, etc.* These measures have been found related to achievement and to specialization choices. A number of findings are planned for publications in the coming year.

Vanderbilt

A personality evaluation sheet is being circulated among those people who deal with students in order to determine what correlations exist between instructors' evaluations of students' personalities and the students' grade levels.

Western Reserve

As part of a broad program for evaluating the impact of a revised curriculum, the development of a number of students is being followed by observation in a variety of learning situations and by interviews and evaluation by members of the faculty. In addition, rating scales are being developed for the evaluation of clinical performance of all students. It is hoped to relate attitude, achievement, and personality variables to performance and to describe patterns of performance and adaptation in the revised curriculum.

Yale

1. Eron has conducted a series of studies to determine the distribution of cynicism, humanitarianism, and general anxiety in medical students, and to observe the process of attitudinal change while students are in medical school. (1). The *Sarason-Mandler General Anxiety Scale* was used to measure anxiety, and scales specially constructed by Eron to measure cynicism and humanitarianism. Although the process of attitudinal change has so far been studied on cross-sectional data, this research may be extended to include longitudinal studies. Also planned is a comparison between performances on *Thematic Apperception* and *Sentence-Completion Tests* by the most and the least cynical subjects.
2. *Rorschach* scores made by 35 medical students were compared with those of 35 divinity students (2). Of the comparisons made, fewer were significant than would be expected by chance.

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APPENDIX D – Roster of Participants, 1956 Teaching Institute

ARRAGON, R. F., *Professor of History*, Reed College
BAKEMAN, GEORGE W., *Associate Dean*, Medical College of Virginia
BAKER, ROLLO, *Assistant Dean*, Ohio State University College of Medicine
BELL, LENNOX G., *Dean*, University of Manitoba Faculty of Medicine
BERGERON, GEORGES A., *Department of Physiology*, Laval University Faculty of Medicine
BERRY, GEORGE PACKER, *Dean*, Harvard Medical School
BERSON, ROBERT C., *Dean*, Medical College of Alabama
BLANCHARD, KENNETH C., *Associate Dean*, Johns Hopkins University School of Medicine
BLANDAU, RICHARD J., *Assistant Dean*, University of Washington School of Medicine
BROOKS, T. J., *Chairman*, Department of Preventive Medicine and Public Health, University of Mississippi Medical Center
BROWN, CHARLES L., *Dean*, Seton Hall College of Medicine and Dentistry
BURNHAM, PAUL S., *Associate Professor of Psychology*, Yale University Student Appointment Bureau
CADBURY, WILLIAM E., Jr., *Dean*, Haverford College
CALVIN, D. BAILEY, *Dean*, Student and Curricular Affairs, University of Texas Medical Branch
CAUGHEY, JOHN L., Jr., *Associate Dean*, Western Reserve University School of Medicine
CEITHAML, JOSEPH J., *Dean of Students*, University of Chicago, The Division of Biological Sciences
CLARK, SAM L., *Professor (Head) of Anatomy*, Vanderbilt University School of Medicine
COLBERT, JAMES W., Jr., *Dean*, St. Louis University School of Medicine
COLE, ARCH E., *Professor of Anatomy*, University of Louisville School of Medicine
COOPER, JOHN A. D., *Associate Professor of Biochemistry*, Northwestern University Medical School
COWLES, JOHN T., *Assistant for Personnel Services to the Vice Chancellor*, Health Professions, and *Professor of Psychology*, University of Pittsburgh
CREDE, ROBERT H., *Associate Professor of Medicine*, University of California School of Medicine (San Francisco)
DARLEY, JOHN G., *Associate Dean*, University of Minnesota Graduate School
DARLEY, WARD, *Executive Director*, Association of American Medical Colleges
DORCUS, ROY M., *Dean*, Division of Life Sciences, University of California at Los Angeles
EGAN, RICHARD L., *Assistant Dean*, Creighton School of Medicine
EMERSON, KENDALL, Jr., *Assistant Dean*, Harvard Medical School
EVANS, LESTER J., *Executive Associate*, The Commonwealth Fund
FENNINGER, LEONARD D., *Assistant Dean*, University of Rochester School of Medicine and Dentistry
FIESER, LOUIS F., *Professor of Chemistry*, Harvard University
FLEMING, DONALD, *Secretary*, Faculty of Medicine, McGill University Faculty of Medicine
FORBES, THOMAS R., *Assistant Dean*, Yale University School of Medicine
FRAPPIER, JEAN, *Department of Histology*, University of Montreal Faculty of Medicine
FRYE, WILLIAM W., *Dean*, Louisiana State University School of Medicine
FUNKENSTEIN, DANIEL H., *Clinical Associate in Psychiatry*, Harvard Medical School
GALARNEAULT, THOMAS P., *Administrative Assistant to the Dean*, Stritch School of Medicine of Loyola University
GEE, HELEN HOFER, *Director of Research*, Association of American Medical Colleges
GHANTUS, M., *Associate Dean of the Medical Faculty*, American University of Beirut
GLASER, ROBERT J., *Associate Dean*, Washington University School of Medicine (St. Louis)
GRULEE, CLIFFORD G., Jr., *Assistant Dean*, Tulane University School of Medicine
HANDLER, JOEL S., *Clinical Assistant Professor in Psychiatry*, University of Illinois College of Medicine
HANLON, LAWRENCE W., *Associate Dean*, Cornell University Medical College
HARRELL, GEORGE T., *Dean*, University of Florida College of Medicine

HARWOOD, THEODORE H., *Dean*, University of North Dakota School of Medicine

HAYMAN, JOSEPH M., JR., *Dean*, Tufts College Medical School

HEDGPETH, E. MCG., *Clinical Associate Professor of Medicine*, University of North Carolina School of Medicine

HERBUT, PETER A., *Professor of Pathology*, Jefferson Medical College

HIBLER, FRANCIS W., *Partner*, Rohrer, Hibler & Replogle

HILL, JOSEPH K., *Secretary of the Medical Center*, State University of New York at New York City

HINMAN, E. HAROLD, *Dean*, University of Puerto Rico School of Medicine

HIRSCHBOECK, JOHN S., *Dean*, Marquette University School of Medicine

HOBBS, G. E., *Assistant Dean*, University of Western Ontario Faculty of Medicine

HOERR, NORMAND L., *Chairman*, Department of Anatomy, Western Reserve University School of Medicine

HUNTER, THOMAS H., *Dean*, University of Virginia School of Medicine

HURTADO, ALBERTO, *Dean*, Faculty of Medicine, San Marcos University, Lima, Peru

JACKSON, GEORGE GEE, *Associate Professor of Medicine*, University of Illinois College of Medicine

JACOBSEN, CARLYLE F., *Executive Dean for Medical Education*, State University of New York

JASON, ROBERT S., *Dean*, Howard University School of Medicine

JOHNSON, DAVIS G., *Assistant Dean*, State University of New York, Upstate Medical Center, Syracuse

JONES, OLIVER P., *Professor and Head of Department of Anatomy*, University of Buffalo School of Medicine

KELLY, E. LOWELL, *Professor of Psychology*, University of Michigan

KENNEDY, WILLIAM B., *Vice Dean*, University of Pennsylvania School of Medicine

KOHL, SCHUYLER G., *Associate Professor of Obstetrics and Gynecology*, State University of New York College of Medicine (New York City)

LACKEY, ROBERT W., *Assistant Dean*, Student and Curricular Affairs, University of Texas, Southwestern Medical School

LAWRASON, F. DOUGLAS, *Dean*, University of Arkansas School of Medicine

LEE, PETER V., *Assistant Dean*, University of Southern California School of Medicine

LITTLE, J. MAXWELL, *Registrar and Professor of Pharmacology*, Bowman Gray School of Medicine of Wake Forest College

LUDWICK, N. VOLNEY, *Professor*, Department of Radiology, Hahnemann Medical College and Hospital of Philadelphia

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